PIT AND QUARRY

JULY 1953

25th Annual Cement Plants Number

Rotary Kilns at Lehigh's New Cement Plant, Bunnell, Fla. (See Page 98.)

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FOR DEPENDABLE HEAVY-DUTY SHIPPING SACKS...

there is no substitute for kraft!

Kraft, manufactured from wood fibers, is the strongest paper known to industry. It was introduced in this country in 1908, just about the time when the first generation of Gilmans started manufacturing bags.

As pioneers, we have spanned the years with practical knowledge, technical skills, packaging experience . . . and our modern, completely integrated facilities are a notable example of kraft paper production and conversion.

Now in our 3rd generation of specialization, we are expert in pulp and paper making, in bag manufacturing, in bag printing, in bag designing.

Dependable as a Source . . .
Dependable as a Service

MADE-TO-ORDER MULTIWALL SHIPPING SACKS
2 TO 6 PLY—PRINTED OR PLAIN

- Sewn Valve
- Sewn Open Mouth
- Pasted Valve
- Pasted Open Mouth
- Flat Sewn Valve
- Flat Sewn Open Mouth

KRAFT BAG CORPORATION

GILMAN PAPER COMPANY SUBSIDIARY
630 Fifth Avenue, New York 20, N.Y.
Daily News Bldg., Chicago 6, Ill.
Plants at Gilman, Vt. & St. Marys, Ga.

Gilman PAPER CO.
- St. Marys Kraft Corp.
- Gaylord Container Div.
- The Gilmanton Corp.
- Kraft Bag Corp.

If your product fits into a bag—we'll make the bag to fit your product

If you STALL—profits STOP!

WHEN a tire fails to *grip* and take you through, you lose time and money. When a tire "dies" on the job, men and equipment stand idle, profits disappear.

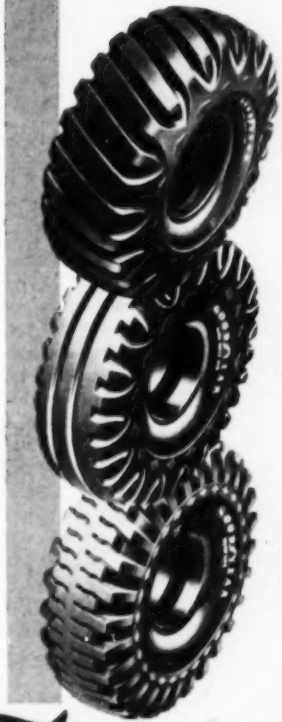
That's why the *only* tires you can afford are the best *workers*—the ones that can take on tire-killing jobs, day in, day out—and keep going!

Only worlds of experience can build such tires—*and Goodyear has it*—for Goodyear has built more tires for more uses than anyone else on earth!

This enormous, unequaled experience gives Goodyear a *practical* approach to your tire problems that means better pull and longer wear. So why not protect *your* profits with the tires that have *proved* they pay their own way, day after day, on the toughest jobs on earth?

Goodyear, Truck Tire Department, Akron 16, Ohio

FOR EACH JOB, THERE'S A COST-CUTTING GOODYEAR TIRE!



You can't beat the
HARD ROCK LUG
for stamina and bruise resistance on jobs where rocks and snags ruin other tires.

You can't beat the
HARD ROCK RIB
for front wheels on all tire-killing service. Rugged—smooth rolling—easy steering.

You can't beat the
ROAD LUG
for toughness and super-traction OFF the road and long, smooth mileage ON the road.

Road Lug—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

PIT AND QUARRY, July 1953, Vol. 46, No. 1. Published monthly by the Pit and Quarry Publications, Inc., 431 South Dearborn St., Chicago 5, Ill. Subscription price $3 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $3 additional for each year. Single copy 50 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1879.

. . . *and*

HERE'S THE COMPRESSOR THAT CARRIED THE BRUNT OF THE DRILLING JOB!

QUOTE:

"The Schramm 315 c.f.m. Diesel Engine Driven Compressor illustrated is being used by the Racquette River Construction Corporation, Potsdam, N. Y., on the Niagara Mohawk Power Corporation job at Carry Falls.

For the past year, this compressor has carried the brunt of our drilling for rock excavation. pressure grout holes, and rock rip rap quarrying. We ordinarily use four individual hammers drilling two feet to six feet holes and occasionally have out as much as eight hundred feet of ¾" hose, in the aggregate. For the grout holes and rip rap, we use the machine to operate two 50 pound wagon-mounted hammers drilling twenty feet holes.

When not employed as mentioned above, we use the compressor for such other jobs as cleaning concrete surfaces with air, pumping water (with an air mop) and pressure grouting."

Cordially yours,
RACQUETTE RIVER CONSTRUCTION CORP.

Frederick Rexford,
Superintendent

Write today for Bulletin 5101A

SCHRAMM, INC.

The Compressor People

WEST CHESTER • PENNSYLVANIA

SCHRAMM AIR COMPRESSORS

A SIZE AND MODEL FOR EVERY AIR NEED

REDUCE YOUR COST WITH

....Teeth that really Dig!

Positive Locking FLEX-PIN CONNECTION

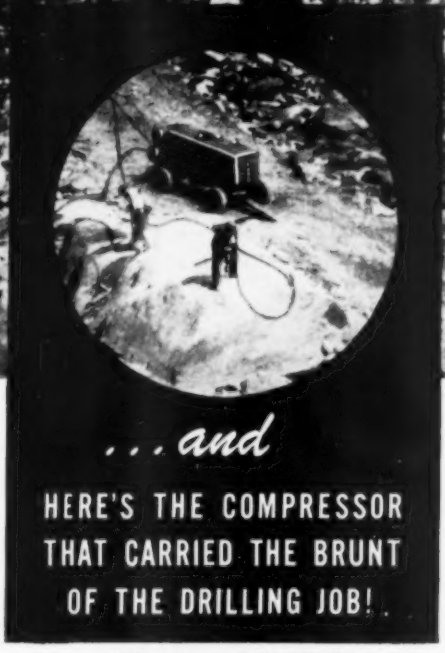
CENTER SECTION OF FLEX-PIN CONTACTS FORWARD PORTION ONLY OF OVAL HOLE IN ADAPTER PROVIDING BEARING FOR FULL WIDTH.
LIVE RUBBER VULCANIZED IN CENTER OF FLEX-PIN IS UNDER COMPRESSION, EXERTING A CONSTANT PRESSURE TO HOLD THE POINT TIGHT ON THE ADAPTER.
ENLARGED ENDS OF FLEX-PIN CONTACTS BACK OF OVAL HOLE IN POINT ON BOTH SIDES HOLDING IT ON SECURELY AND PREVENTS SIDE MOVEMENT OF POINT.

Pat. No. [illegible] other patents pending

H&L TOOTH COMPANY

(Pioneer Manufacturers of Two-Part Teeth)

1562 SO. GREENWOOD AVE. MONTEBELLO, CALIFORNIA



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Pat. No. 2326771
other patents pending
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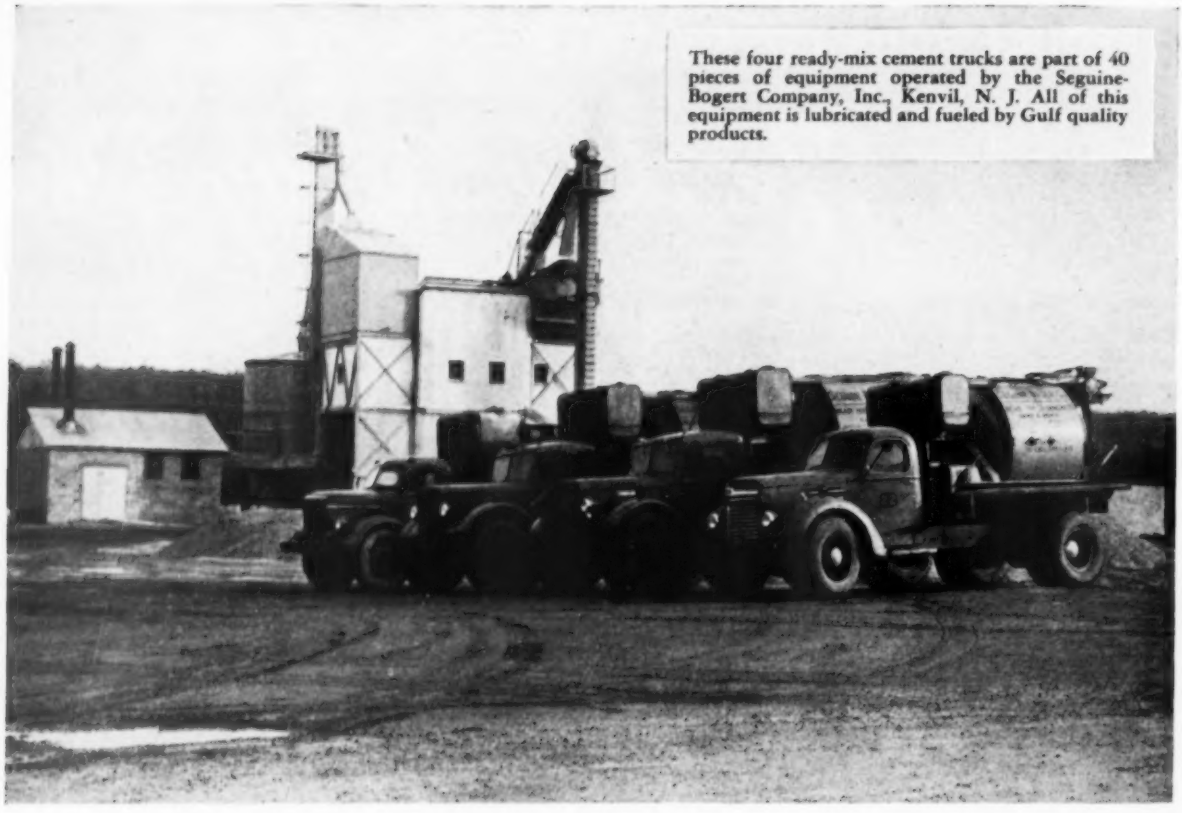
(Pioneer Manufacturers of Two-Part Teeth)

1542 SO. GREENWOOD AVE. MONTEBELLO, CALIFORNIA



These four ready-mix cement trucks are part of 40 pieces of equipment operated by the Seguine-Bogert Company, Inc., Kenvil, N. J. All of this equipment is lubricated and fueled by Gulf quality products.

Gulf Quality Fuels *and* Lubricants

keep equipment rolling smoothly at Seguine-Bogert Company

Here's a combination that can't be beat for keeping heavy-duty truck engines operating economically and trouble-free —Gulf Quality Fuels and Lubricants.

Gulf gasolines and Diesel fuels burn evenly and completely. This means less fuel deposits and a cleaner exhaust.

Gulf detergent-type motor oils keep engines clean as they lubricate efficiently. They help prevent the formation of sludge, varnish, and rust. Engines use less oil and require fewer overhauls.

These quality features of Gulf Products are reflected in higher equipment availability and lower maintenance costs. That's why so many leaders in the industry select them for their equipment. Gulf products and fine service are available through more than 1400 warehouses in 31 states from Maine to New Mexico.

GULF OIL CORPORATION • GULF REFINING COMPANY
PITTSBURGH 30, PENNSYLVANIA

GULF SERVES INDUSTRY

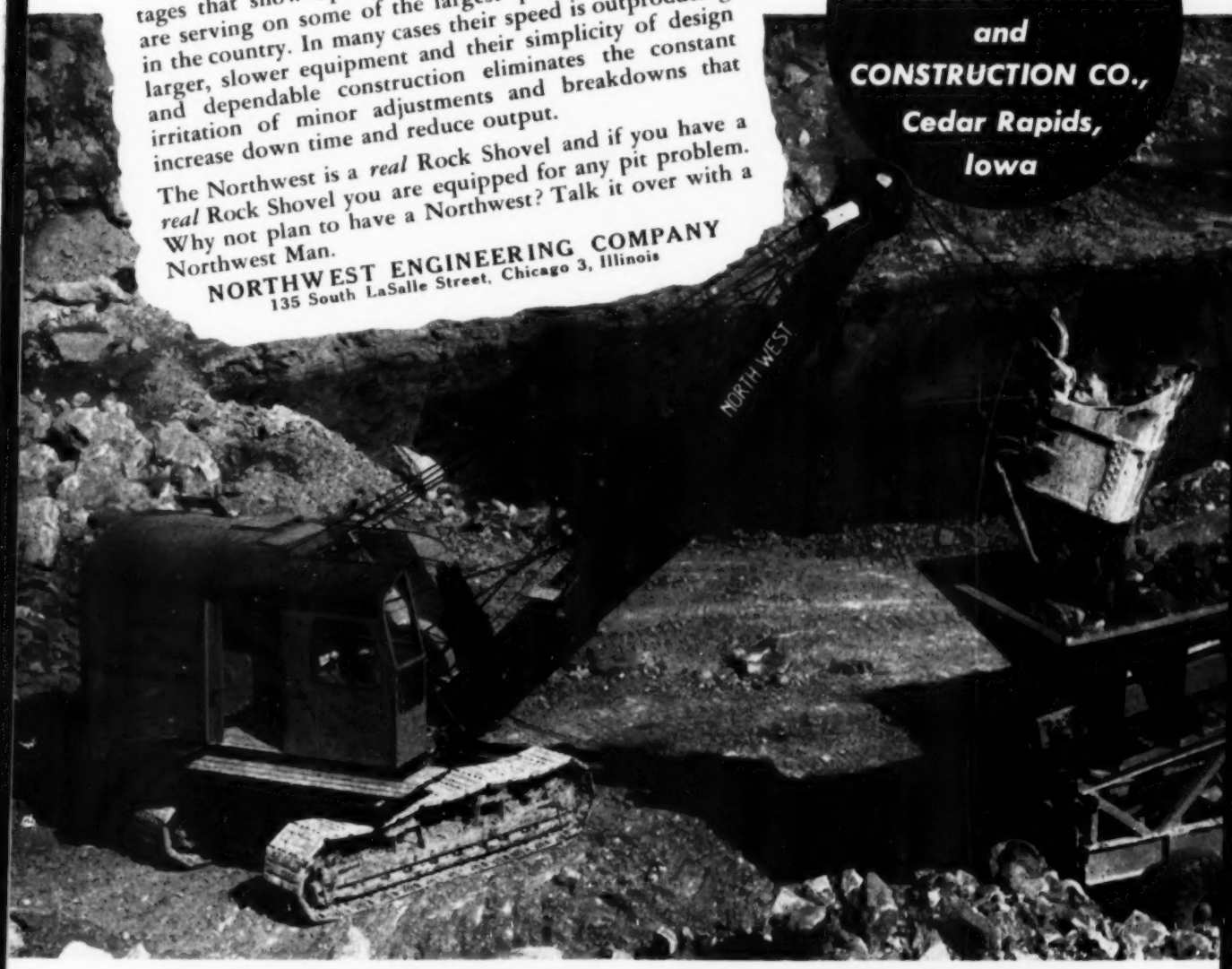
Meeting the ROCK TEST

ROCK is this company's business. Here's a job that would test the mettle of any equipment. Greater crowding force, smoothness of dipper control, easier operation, accuracy of spotting, are just a few of the advantages that Northwest equipment brings you. They are advantages that show up in all hard rock work. Northwests are serving on some of the largest quarrying operations in the country. In many cases their speed is outproducing larger, slower equipment and their simplicity of design and dependable construction eliminates the constant irritation of minor adjustments and breakdowns that increase down time and reduce output.

The Northwest is a *real* Rock Shovel and if you have a *real* Rock Shovel you are equipped for any pit problem. Why not plan to have a Northwest? Talk it over with a Northwest Man.

NORTHWEST ENGINEERING COMPANY
135 South LaSalle Street, Chicago 3, Illinois

No. 12 for
CONCRETE MATERIALS and CONSTRUCTION CO.,
Cedar Rapids, Iowa



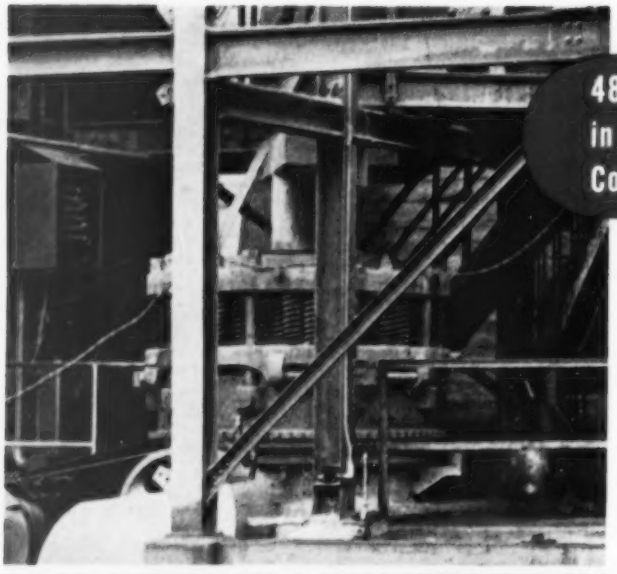
NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

Convertible for any Mining Material Handling or Excavation Problem

TELSMITH

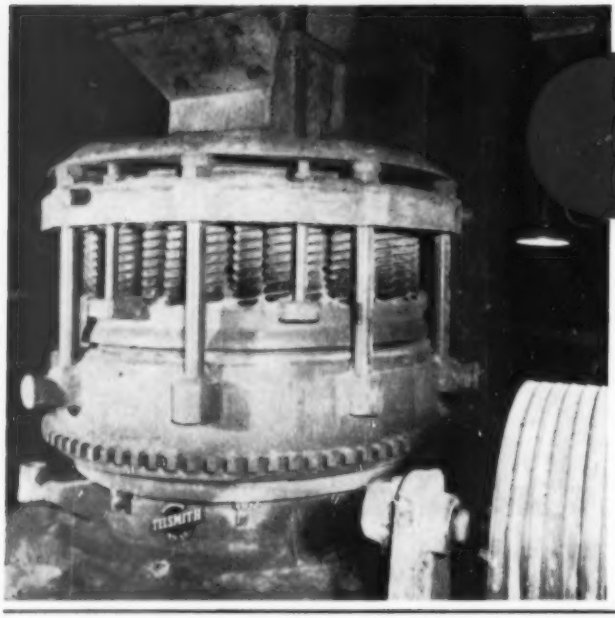
®Gyraspheres in CEMENT MILLS



48-FC Telsmith Fine Crushing Gyrasphere in the British Columbia Portland Cement Company Limited plant at Victoria, B. C.

The British Columbia Portland Cement Company Limited wanted to deliver a finer feed to their cement grinding mills—and thus increase output. To do it, they installed early in 1952, a Telsmith 48 Fine Crushing Gyrasphere to crush cement clinker from 2″ to minus 3/8″.

They are thoroughly satisfied!



48-S Telsmith Standard Gyrasphere in Kosmos Portland Cement Co. plant at Kosmosdale, Kentucky.

The Kosmos Portland Cement Co. has operated their Telsmith 48-S Gyrasphere 24 hours a day since July, 1951—crushing 100 tons per hour of 220 to 275-degree limestone from 4 1/2″ down to 5/8″.

They are thoroughly satisfied!

Send for Bulletin No. 274

Y-13

SMITH ENGINEERING WORKS, 504 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

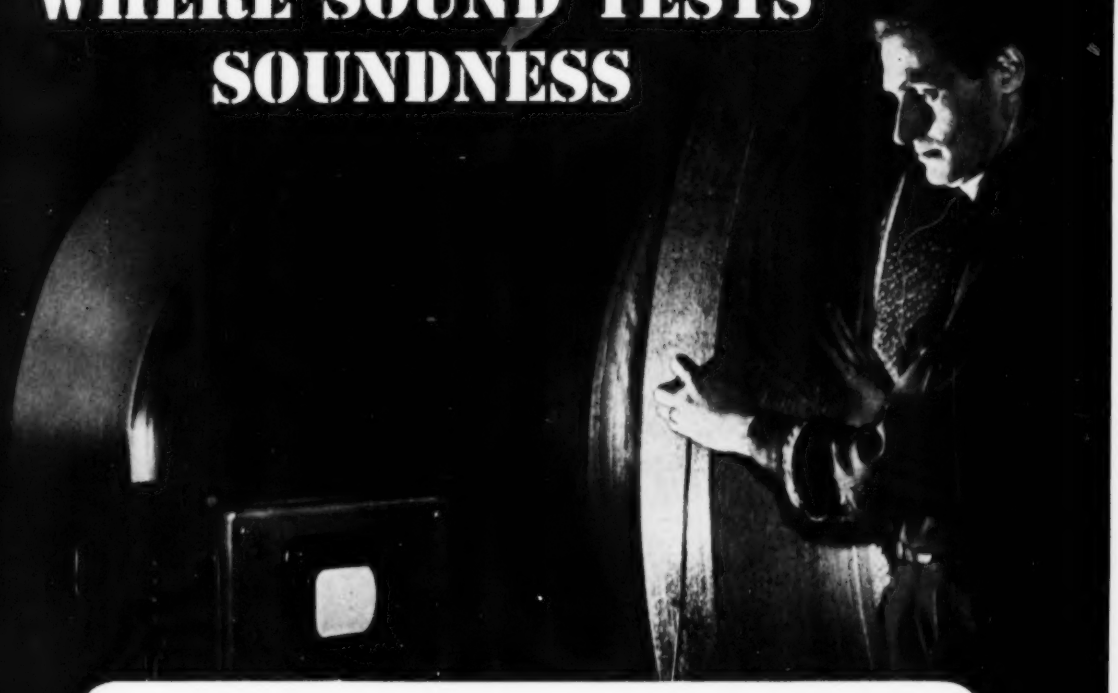
Cable Address: Sengworks, Milwaukee

51 East 42nd St., New York 17, N. Y. • 211 W. Wacker Drive, Chicago 6, Ill. • 713 Commercial Trust Bldg., Philadelphia 2, Pa. • 238 Main Street, Cambridge 42, Mass. • Boehck Eqpt. Co., Milwaukee 3, Wis. • The McLean Co., 3525 Lakeside Ave., Cleveland 14, Ohio

Marens Eqpt. Co., 432 Main St., Rochester, Mich. • Clyde Eqpt. Co., Portland 9, Ore., & Seattle 4, Wash. • Mines Eng. & Eqpt. Co., San Francisco 4, Calif.

Rish Eqpt. Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va. • Interstate Equipment Co., Statesville, N. C.

WHERE SOUND TESTS SOUNDNESS



MIDVALE ULTRASONIC TESTS ASSURE QUALITY BEYOND THE CALL OF SPECIFICATIONS

- Pressure Vessels
- Forgings and Rings
- Hardened & Ground Steel Rolls
- Corrosion and Heat Resisting Castings
- Ordnance & Armor

Sound Waves "bouncing" up to ten million cycles per second seek out and find the smallest defect . . . assure quality forgings at Midvale . . . Ultrasonic waves able to penetrate thirty feet of the toughest steel.

In addition two million volt X-Ray unit . . . magnetic particle inspection . . . "black light" . . . dye penetrants are but a few of the many ways Midvale craftsmen safeguard unsurpassed quality.

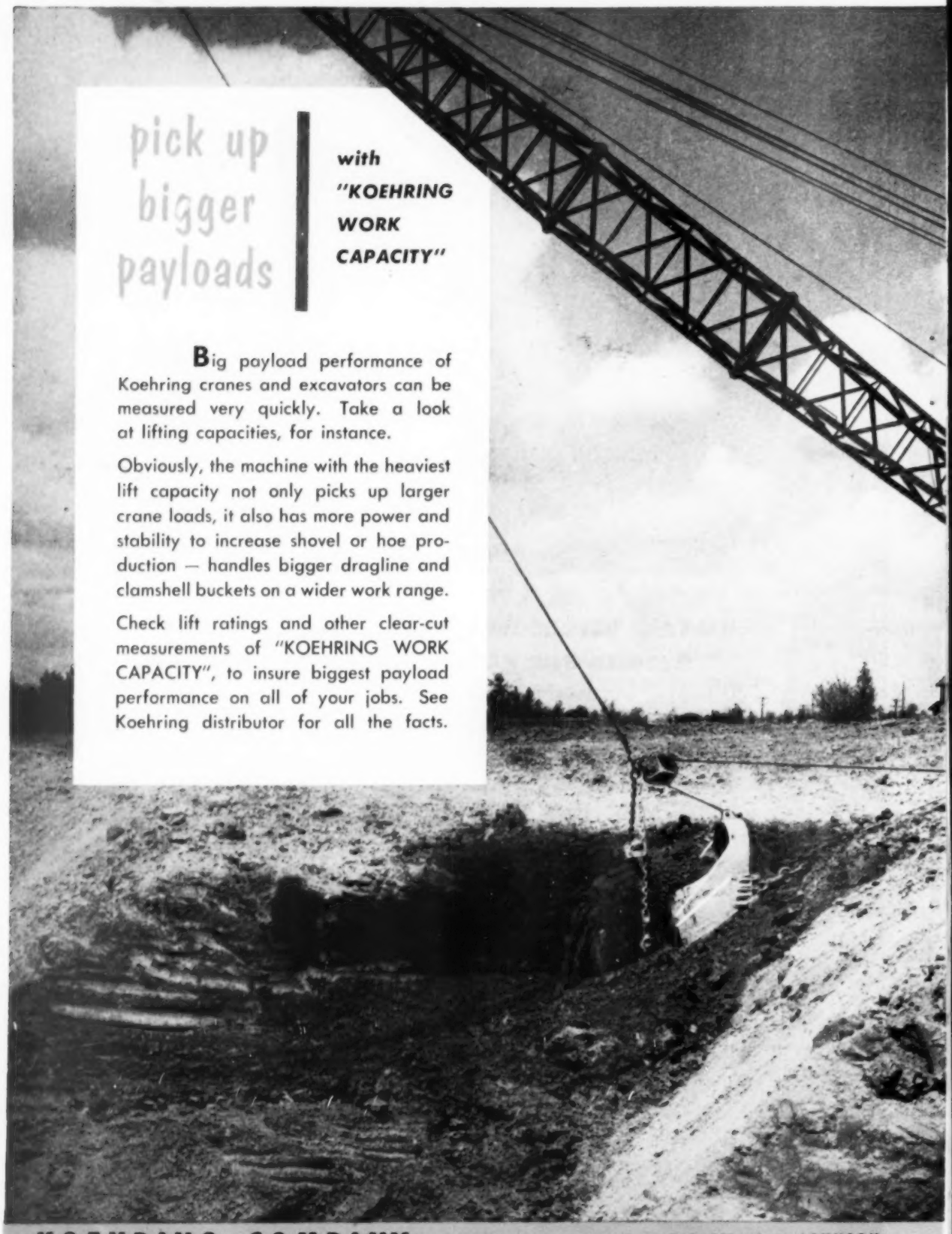
Midvale precision and performance can supply all your needs for heavy equipment in industry. Pressure vessels . . . hardened and ground steel rolls . . . weldless rings . . . forgings . . . heat and corrosion resistant castings. If the job is big, specifications exacting, peak quality a "must", you can rely on Midvale craftsmen.

THE MIDVALE COMPANY
NICETOWN, PHILADELPHIA 40, PA.
OFFICES: NEW YORK • CHICAGO • PITTSBURGH
WASHINGTON • CLEVELAND • SAN FRANCISCO

MIDVALE

Custom Steel Makers to Industry

PRODUCERS OF FORGINGS, ROLLS, RINGS, CORROSION AND HEAT RESISTING CASTINGS



pick up bigger payloads

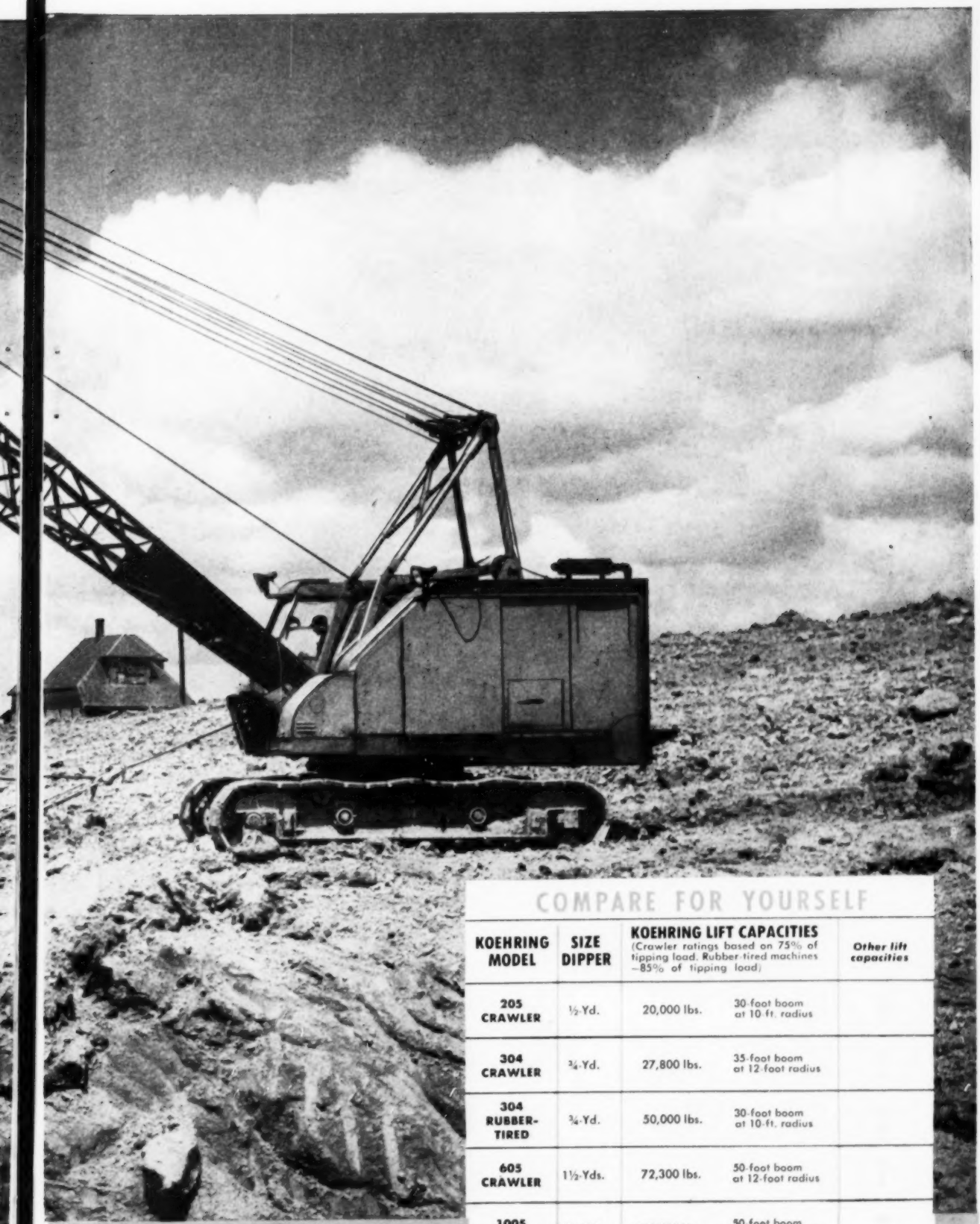
with "KOEHRING WORK CAPACITY"

Big payload performance of Koehring cranes and excavators can be measured very quickly. Take a look at lifting capacities, for instance.

Obviously, the machine with the heaviest lift capacity not only picks up larger crane loads, it also has more power and stability to increase shovel or hoe production — handles bigger dragline and clamshell buckets on a wider work range.

Check lift ratings and other clear-cut measurements of "KOEHRING WORK CAPACITY", to insure biggest payload performance on all of your jobs. See Koehring distributor for all the facts.

KOEHRING COMPANY Milwaukee 16, Wis. Subsidiaries: JOHNSON PARSONS • KWIK-MIX



COMPARE FOR YOURSELF

KOEHRING MODEL	SIZE DIPPER	KOEHRING LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines —85% of tipping load)		*Other lift capacities*
205 CRAWLER	½-Yd.	20,000 lbs.	30-foot boom at 10-ft. radius	
304 CRAWLER	¾-Yd.	27,800 lbs.	35-foot boom at 12-foot radius	
304 RUBBER-TIRED	¾-Yd.	50,000 lbs.	30-foot boom at 10-ft. radius	
605 CRAWLER	1½-Yds.	72,300 lbs.	50-foot boom at 12-foot radius	
1005 CRAWLER	2½-Yds.	159,000 lbs.	50-foot boom at 12-foot radius	

K930

YOU NEED

...TO SALVAGE AND REBUILD WORN EQUIPMENT PARTS. THIS NEW PRACTICAL CATALOG TELLS YOU HOW...

WEAR-ARC

HARD-FACING ELECTRODES FOR CORRECTION OF WEAR PATTERNS

AR-19

WEAR-ARC hard-facing electrodes will handle every known rebuilding and hard-facing application . . . in all industries. For every application where wear patterns must be corrected . . . to resist impact, abrasion, compression, heat, and corrosion . . . *Wear-Arc* provides the right electrode for the roughest job. *Before you forget it . . . get this manual. It's a gold mine of practical up to date information. Just ask for Bulletin AR53-20.*

ALLOY RODS COMPANY
YORK, PENNSYLVANIA

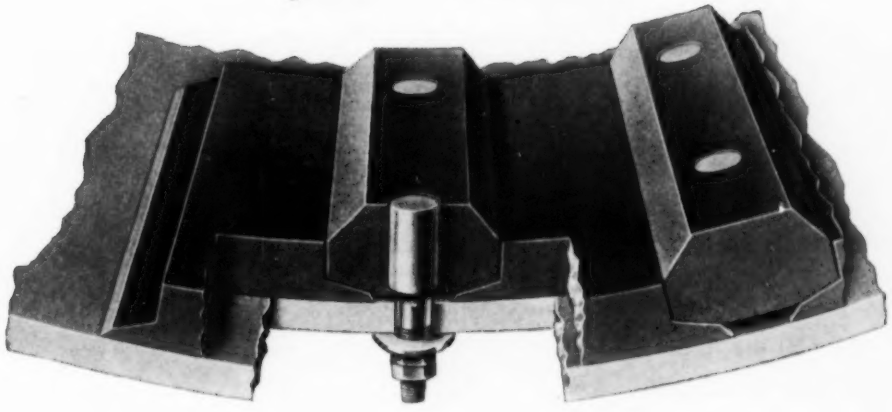
NO FINER ELECTRODES MADE . . . ANYWHERE

Alloy Rods Co.

When you install

U·S·S LORAIN ROLLED PLATE LININGS

you save



Save on installation time and labor. Lorain Liner Plates are made to accurate size and in easily-handled sections . . . can be installed quickly and easily.

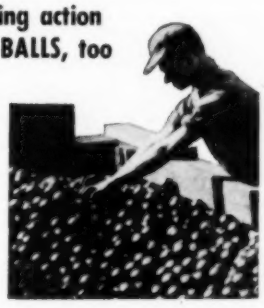
Save valuable grinding space. Because of the strength and resistance to breakage of the rolled steel from which U·S·S Lorain Rolled Plate Linings are made, plates of reduced thickness can be used, thereby increasing the usable diameter of the mill . . . boosting output.

Save on "time out" for repairs. Close fits between ends of plates and between plates and lift bars of U·S·S Lorain Rolled Plate Linings eliminate shell wash and allied troubles which result eventually in costly mill repairs.

Save on replacement materials. Lorain Liner Plates are so rugged they'll wear 'til they're paper thin without failing! And because the plates are interchangeable, severe localized wear at feed or discharge ends of the mill may be balanced just by reversing the worn plates to the opposite end. You get the full life of your linings when they're U·S·S Lorain Rolled Plate Linings!

There are U·S·S Lorain Rolled Plate Linings to fit any type of mill—for wet grinding or dry. Available through leading mill manufacturers whose names will be furnished upon request.

For uniform, efficient grinding action specify U·S·S GRINDING BALLS, too



● For still lower grinding costs and higher grinding efficiency, specify U·S·S Grinding Balls for your mill. They're made to exacting specifications . . . are carefully tested from raw materials to finished product to assure surface hardness and maximum hardness penetration. Available in diameters from $\frac{3}{4}$" to 5". For further information send for our free booklet on U·S·S Grinding Balls.

United States Steel Corporation
Room 2813-H, 525 William Penn Place
Pittsburgh 30, Pa.

Without obligation on my part, please send me your FREE booklet on U·S·S Grinding Balls.

Name .....

Company .....

Address .....

City ..... State .....

UNITED STATES STEEL CORPORATION, PITTSBURGH, PA · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S LORAIN ROLLED PLATE LININGS AND U·S·S GRINDING BALLS

USS

2-994

UNITED STATES STEEL

"QUICK-WAY"

Reg. U.S. Pat. Off.

Speeds Output Increases Profits for PIT AND QUARRY OPERATORS

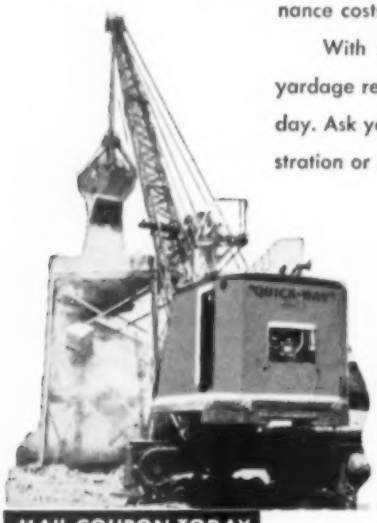
Whether its moving shot rock, sand, or crushed stone, stripping overburden or charging bins, you'll find the "QUICK-WAY" in a class by itself in the ¼ to ½ yard field.

The "QUICK-WAY" features low center of gravity, works easily over the side, has proper balance for truck operation, gives you easy, fast swinging, plenty of reserve power, rugged all steel construction, numerous parts interchangeable. 4 models, ¼ to ½ cubic yard shovel, clamshell, dragline, backhoe, 3 to 10 ton crane capacity. Truck speeds to and from jobs. Low initial cost. Low maintenance costs. Eight different attachments.

With a "QUICK-WAY" you'll roll up yardage records hour after hour, day after day. Ask your distributor for a free demonstration or mail coupon.

"QUICK-WAY" Model E dragline with 30' boom loading gravel

"QUICK-WAY" truck shovel, loading sand



Clinker is handled from the pit to the storage pile and from the storage pile to grinding circuit with a mobile "QUICK-WAY" crane

"QUICK-WAY"
TRUCK SHOVEL CO.
Denver, Colorado, U.S.A.

"QUICK-WAY" crane with skull cracker attachment eliminates secondary shooting.

MAIL COUPON TODAY

"QUICK-WAY" TRUCK SHOVEL CO.
Dept. 143 • 2401 East 40th Ave. • Denver 1, Colorado

Please send me complete details on "QUICK-WAY" Truck Shovels —four different models from 3 to 10 ton crane capacity.

Name _____

Address _____

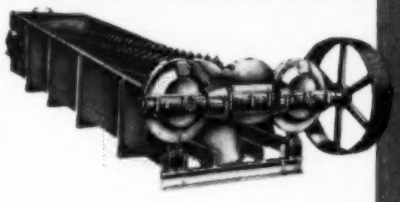
City _____ *State* _____

Specify McLANAHAN EQUIPMENT

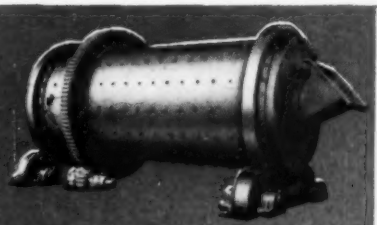
for dependable-low cost FEEDING, CRUSHING, CLEANING in PITS, MINES and QUARRIES

All Steel Rockmaster Single Roll Crusher for primary or secondary work on shovel loaded rock and ore.

A pioneer in the development of many types of processing equipment, McLanahan has served domestic and foreign pits, mines and quarries for more than a century. Shown on this page are a few illustrations of McLanahan equipment for crushing, washing, sizing and conveying all types of ore, coal and rock. Technical details and price information will be sent upon request.

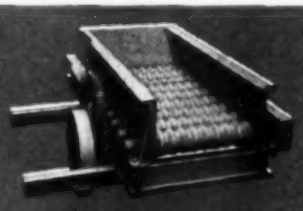


Log Washer for removing tough clay and soft rock from various materials.



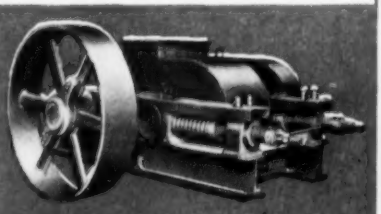
Steel Paddle Mill Scrubber—high capacity for cleaning large size feed.

Heavy Duty Reciprocating Plate Feeder. Handles any material from sand sizes to shovel loaded rock and ore.

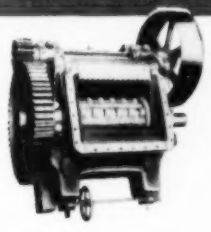


Live roll Grizzly for sizing and feeding various products.

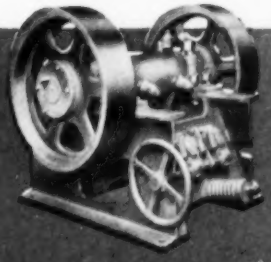
Double duty combination Scrubber and Sizing Screen for large and small capacities.



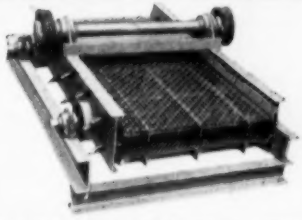
Heavy Duty Fabricated Block Diamond Double Roll Crusher for secondary reduction.



Automatic Steelstrut Crusher for primary and secondary work in small plants.



Fabricated Jaw Crusher for primary and secondary work.



Single and Double Deck Vibrating Screens in different sizes.

DEPENDABLE PRODUCTS:

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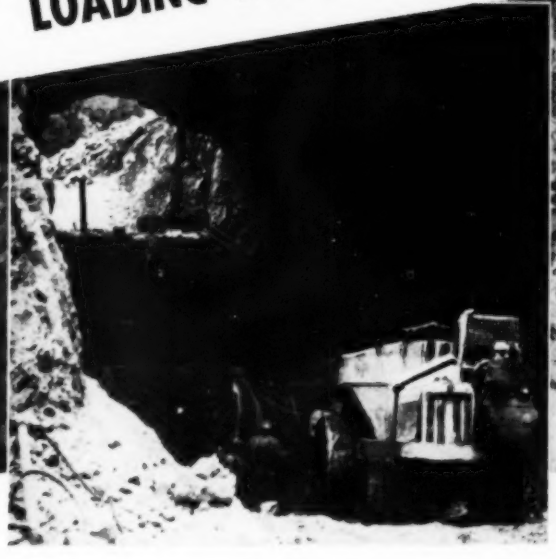

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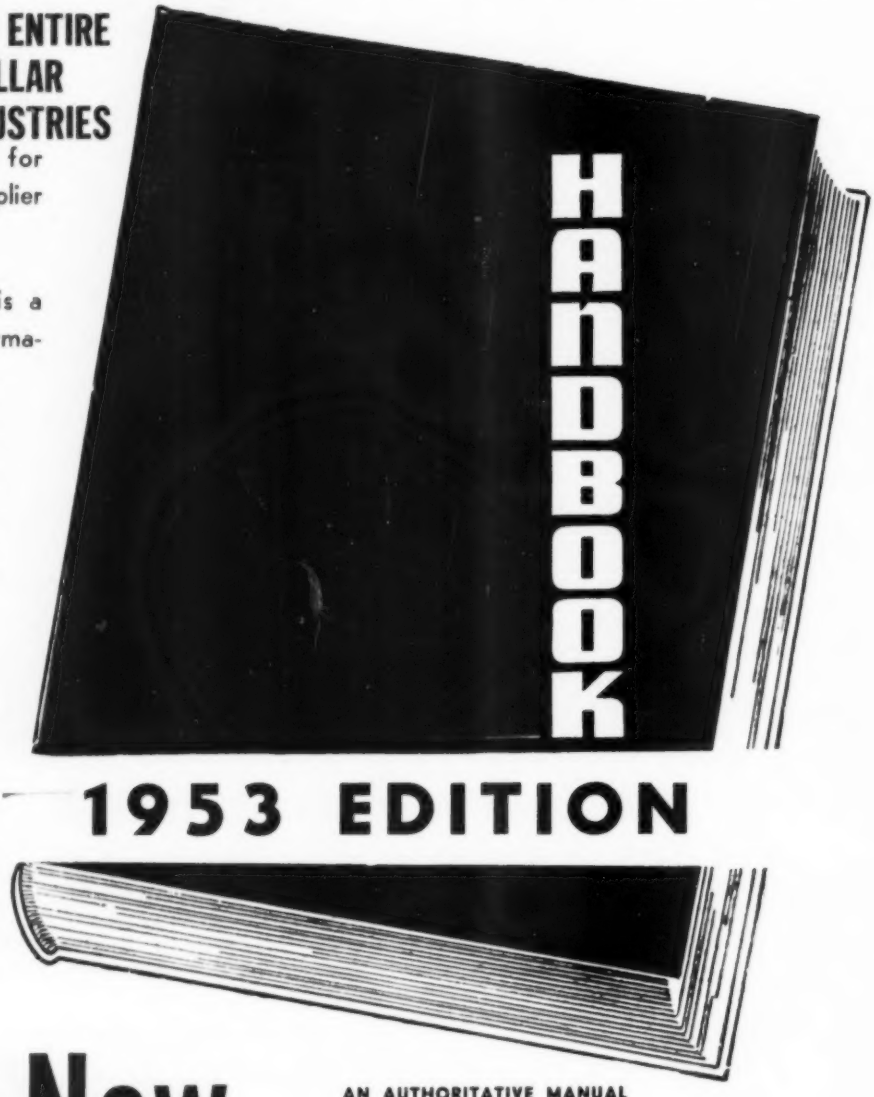

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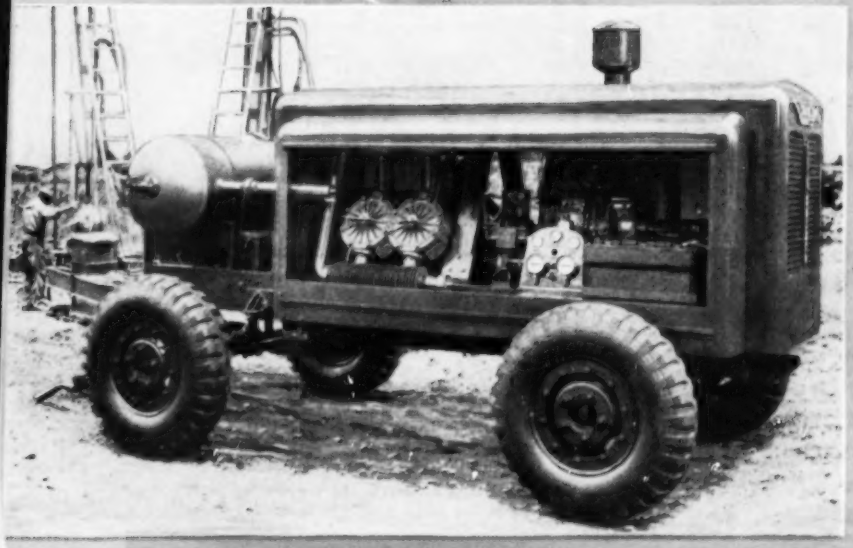

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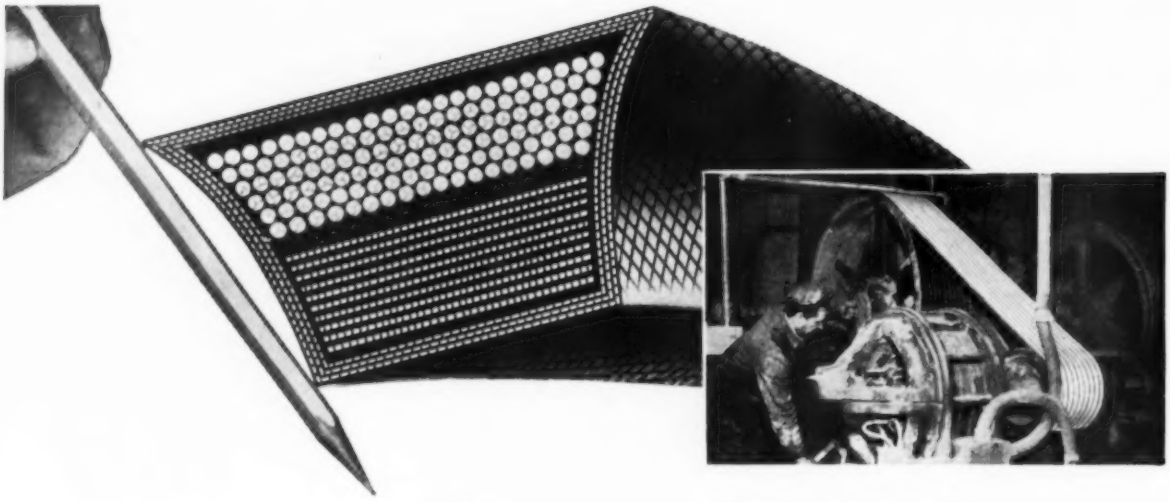

Gates V-Belts are built with CONCAVE SIDES

(U.S. PATENT NO. 1813698)

...that's why they last longer!

If you want lower V-Belt costs, just make this simple test...pick up *any* V-Belt and bend it as if it were going around a pulley.

As the belt bends, grip its sides between your fingers and thumb.

If the belt has *straight sides* you feel the sides bulge out. This forces the sides of the belt to press *unevenly* against the V-pulley . . . and you get concentrated wear at the points shown by the arrows.

Now, try this same test with the V-Belt that is built with CONCAVE SIDES —the Gates Vulco Rope.

As this belt bends, you can feel the CONCAVE SIDES *fill out* and become perfectly straight.

These sides press *evenly* against the V-pulley. All wear is distributed *uniformly* across the full width of the Gates Vulco Rope and the CONCAVE SIDES therefore mean longer belt life and lower V-Belt costs for you.

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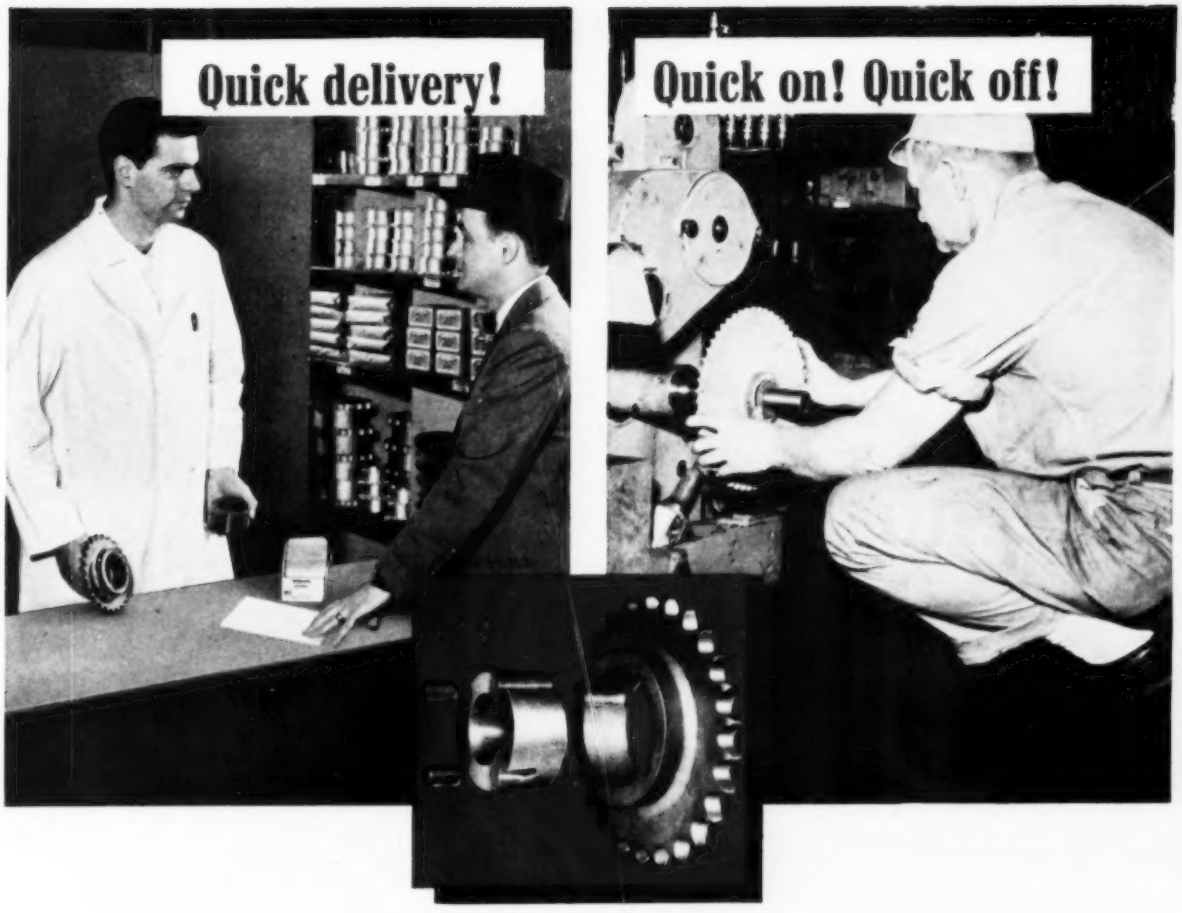

Link-Belt roller chain sprockets with taper lock bushings

HERE'S great news for users of roller chain drives! With the new Link-Belt taper lock sprocket, you don't have to fit the sprocket to the shaft. These sprockets with their taper lock bushings give you the equivalent of a shrink-fit on all standard shaft sizes.

Installation and removal are fast, simple. Set screws force and hold bushing in tapered bore of sprocket, *clamp* it tightly onto shaft. The *full length* of the bushing supports the sprocket on the shaft. Turning set screws in removal holes quickly releases it from shaft.

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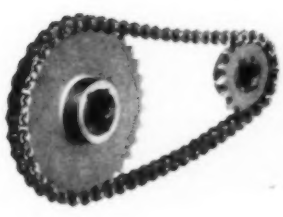

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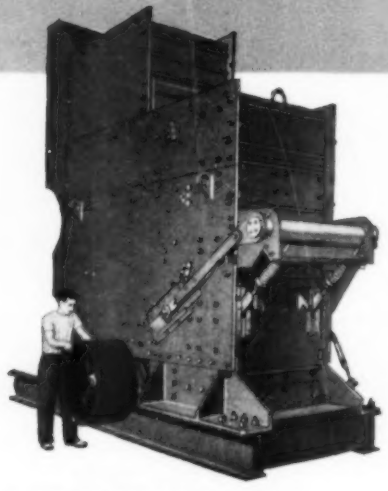

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The reduction is done by the rotor hammers. The speed of the rotors governs the reduction — the greater the speed, the greater the reduction. Three adjustments control percentage of sizes within limits of the finished product.

2 GREATER RATIO OF REDUCTION

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Universal's Impact Master has only two moving parts — the two hammer rotors — and they both rotate freely in the same direction with the flow of material. Rock is broken by impact and the finished material is discharged immediately from the breaking chamber.

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"Eucs" Maintain 87% Job Availability at Norway Mine!

At Sydvaranger iron mine in Norway, a Model TD 22-ton Rear-Dump "Euc" on demonstration worked with a fleet of tractor-trailer units of other make. Performance of this "Euc" and its 25% greater job availability was so impressive that seven additional Rear-Dump Euclids were purchased . . . the original hauling fleet is being replaced or converted to other use.

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The more easily closed PREFORM bagtop first introduced in this country by Bagpak—and now tremendously successful—has been further improved with the PREFORM feature at the bottom—at no additional cost.

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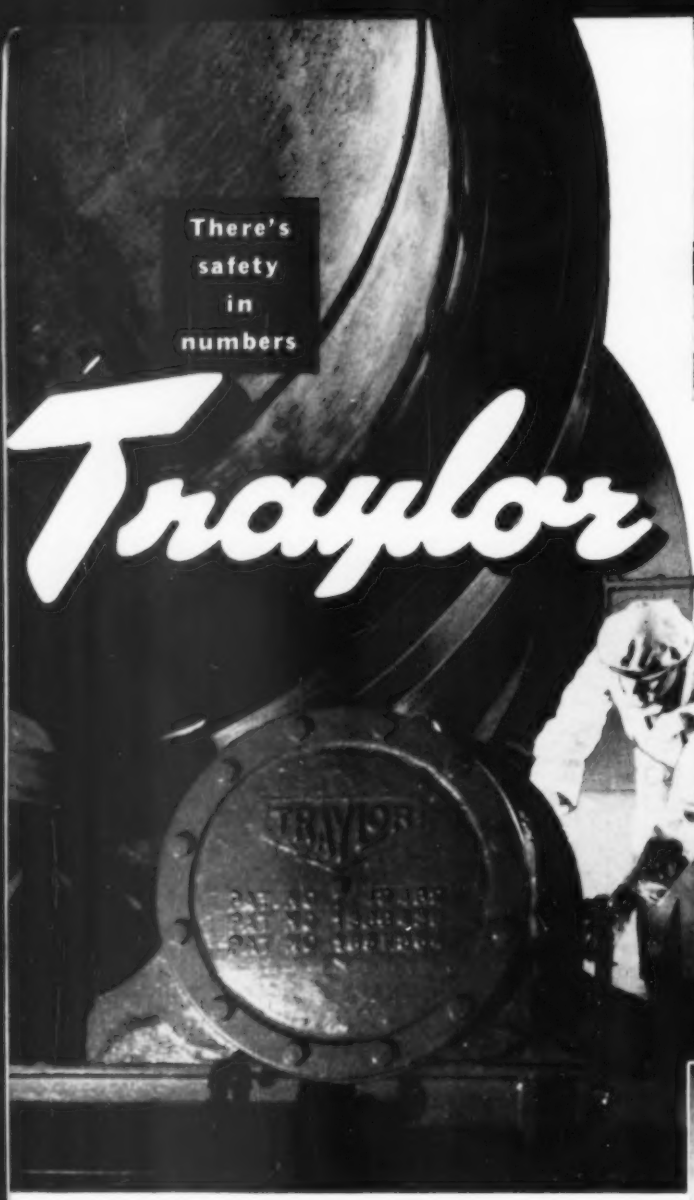
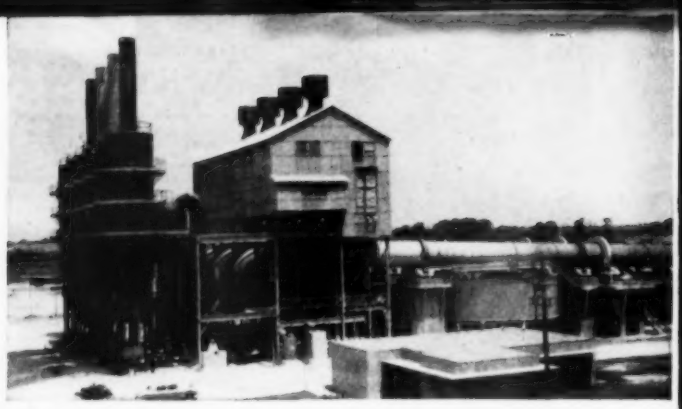
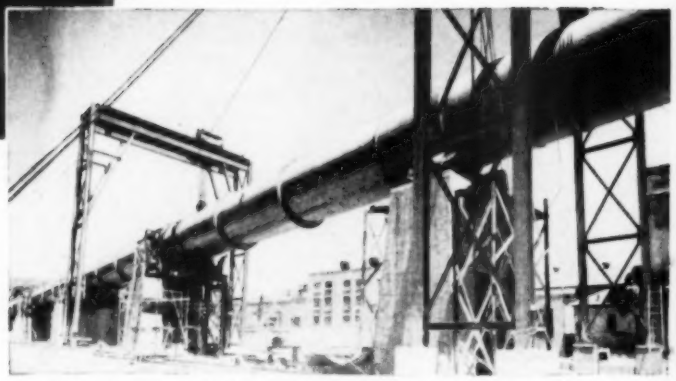




Baton Rouge, La. - 3 of 4 9'6" x 250'0" Traylor Kilns installed in the plant of a leading Cement Producer.

HAS BUILT 40 Rotary Kilns DURING THE PAST 2 YEARS



Covington, Va. - 11'0" x 350'0" Lime Kiln purchased by another leading paper maker for lime sludge recovery.

Palatka, Fla. - 7'0" x 200'0" Kiln in the plant of a paper manufacturer, used for lime sludge recovery.

Each Kiln individually "Traylored" for the efficient production of one of the following 13 different products.

Lime • Titanium Oxide • Bauxite • Cement • Sodium Silicate
Dolomite • Iron Sulphide • Alumina • Sinter-Alumina • Calcium
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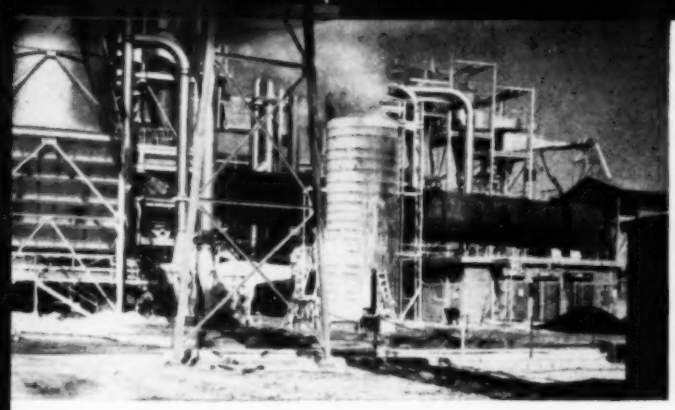
A rotary kiln represents an important investment for any company. Leading producers all over the world have come to rely on Traylor's past experience to avoid future production headaches. Play it safe. Depend on the proven ability of Traylor engineers to assure the production you anticipate when expanding or modernizing your plant facilities.

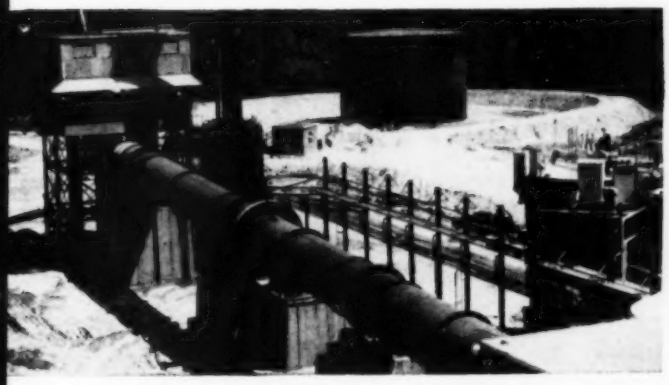


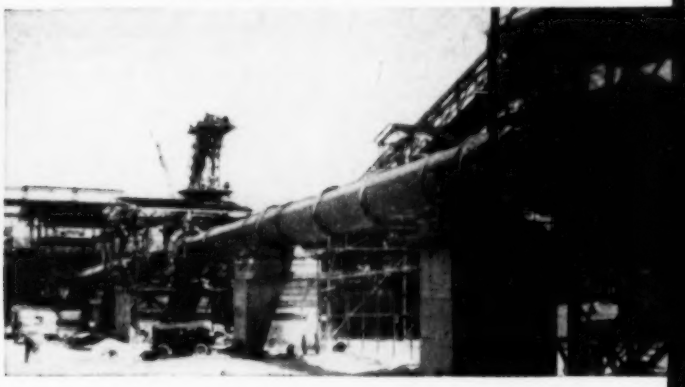
Lompoc, Calif. - An 11'0" x 100'0" Kiln producing Diatomaceous Earth.

Acme, N.C. - Traylor 8'6" x 215'0" Lime Sludge Recovery Kiln in plant of well known paper manufacturer.

Jamaica, B.W.I. - 9'0" x 175'0" Traylor Kiln used in the processing of Bauxite.

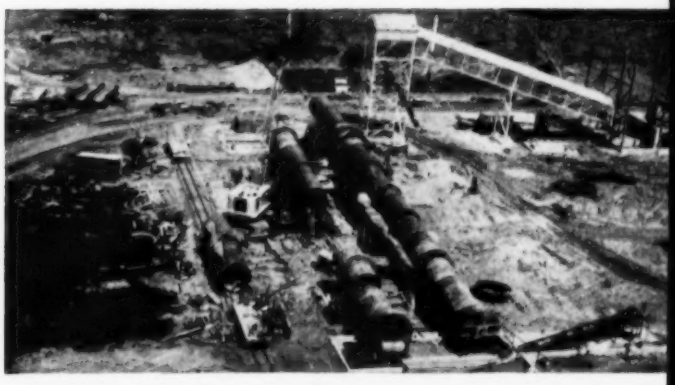
Chile, S.A. - 7'6" x 315'0" for calcining lime, used in the processing of copper ore.





ranging in size from 7' diameter up to 11' diameter x 400' long

Gardanne, France - 9'6" x 250'0" Rotary Kiln installed in the modern alumina plant of a well known overseas company.



Suriname, S.A. - Two of many Traylor Kilns installed in Latin America, these 8'0" x 120'0" kilns will be used in the production of Alumina.

A **Traylor** *Leads to Greater Profits*

York, Pa. - It took 7 flat cars to ship this 10' x 300', 3 section Traylor Kiln to this leading Dolomite producer.

Soon to be released! A new, fully illustrated, bulletin on Traylor Rotary Kilns is now in preparation. It will show the many superior features of Traylor Rotary Kiln design in detail. Mail the coupon today to be sure of getting up-to-date information you can't afford to miss.

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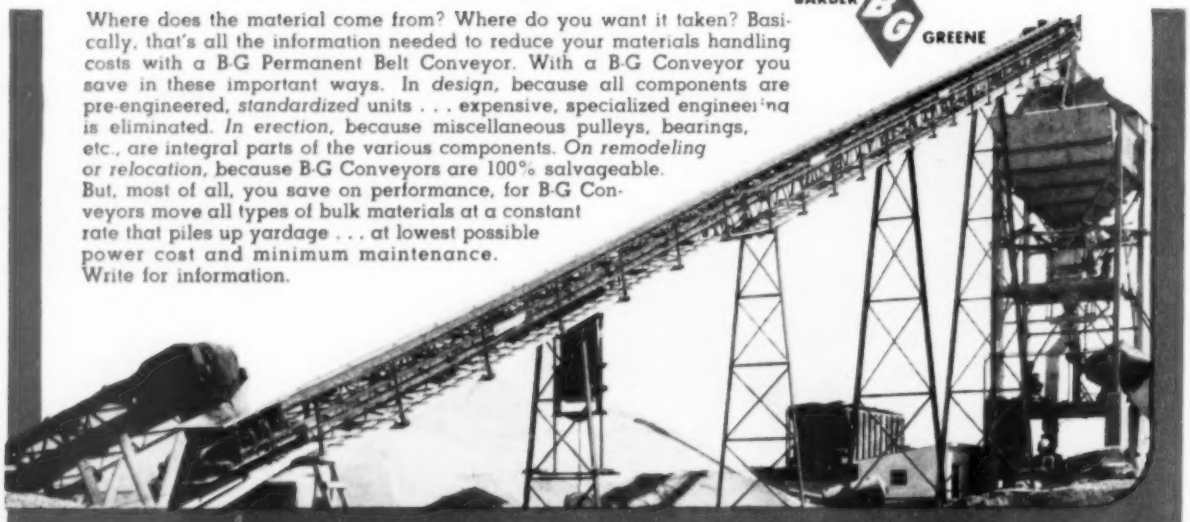

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The details about 93-M strength, power and stamina to handle big assignments may point the way to a happy solution of some excavating problem for you. Why not ask your nearest MARION representative today about 93-M Diesel and Ward-Leonard electric machines?

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Why U. S. Rainbow V-Belts are superior: No. 1 in a series.

You can be sure there will be no slipping on the drive when you use a U. S. Rainbow V-Belt. Straight sidewalls grip the grooves the full height of the belt, providing the complete contact which results in much greater pulling power and eliminates slippage.

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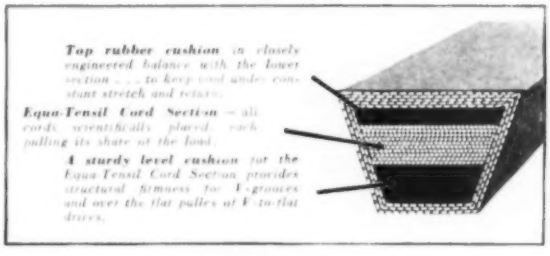
Order from your jobber, or contact any of our 25 District Sales Offices, or write to address below.


Top rubber cushion in closely engineered balance with the lower section . . . to keep cord under constant stretch and tension.
Equa-Tensil Cord Section — all cords scientifically placed, each pulling its share of the load.
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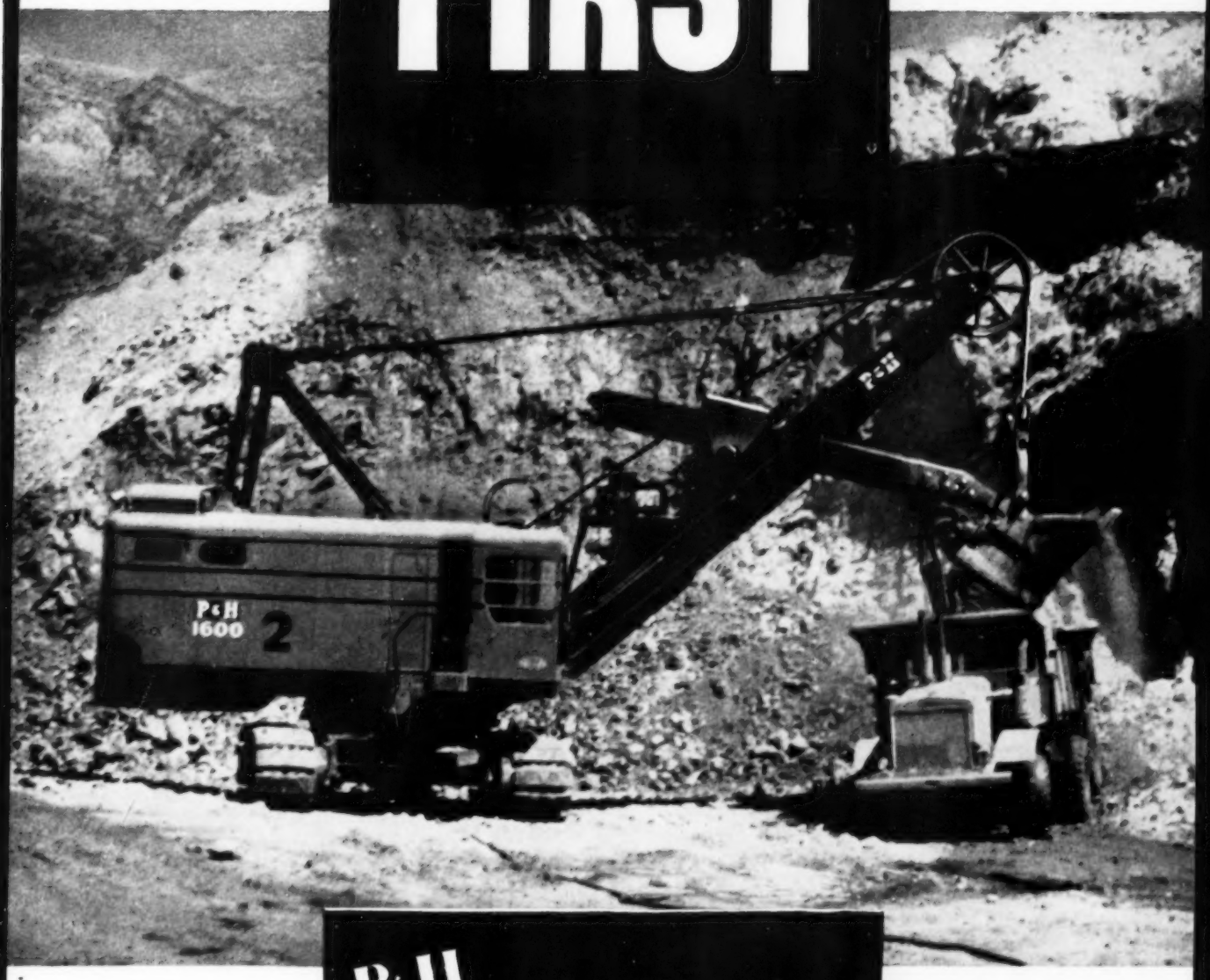

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The first thing you see when you look into P&H Electric Shovels is new ideas—ways of doing things differently. *Differently and better!* For P&H engineering concentrates on one thing . . . cutting *your* production costs!

The result is evident in electrical equipment designed and built by P&H—especially for the purpose—not adapted for it. Stepless power regulation gives you the smoother flow of power without multiple contactors to cause trouble and replacements. There's Magnetorque* Hoist Drive, vertical swing motors, independent propel, powerful worm crowding mechanism with separate crowd motor, air-filtered cab. And there's the all-welded strength of rolled alloy steels to take year-in, year-out punishment.

P&H leadership in electric shovel development gives you leadership in all kinds of open pit work . . . lower tonnage costs! That explains why every third P&H Electric Shovel sold is a repeat order. Get the facts.

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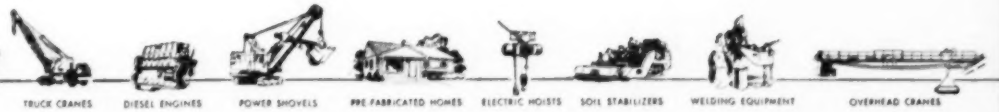
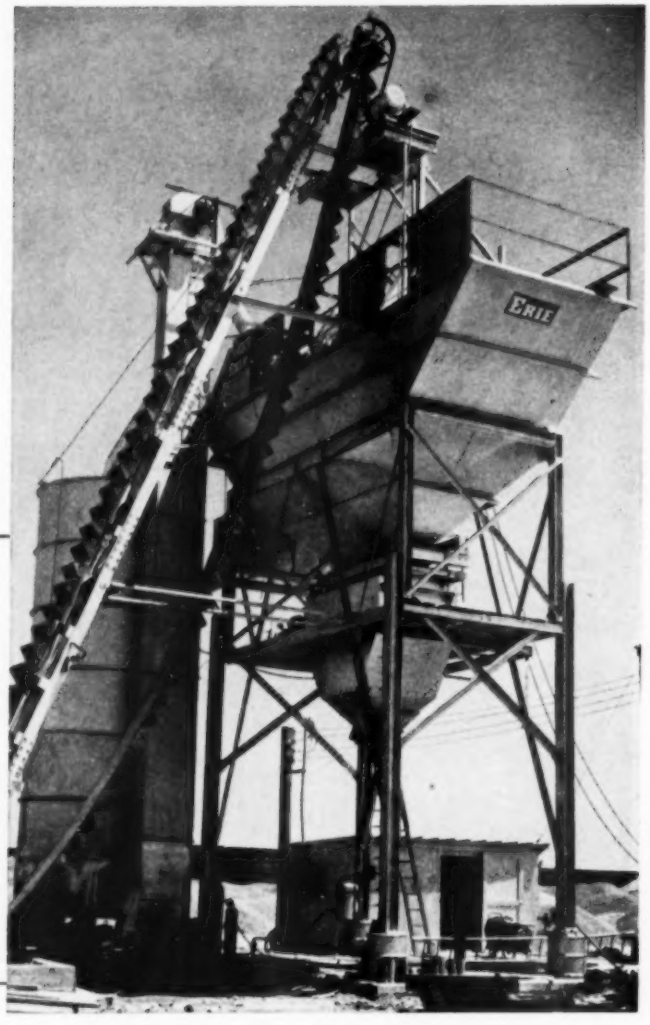
the P&H *Line*



TRUCK CRANES · DIESEL ENGINES · POWER SHOVELS · PRE-FABRICATED HOMES · ELECTRIC HOISTS · SOIL STABILIZERS · WELDING EQUIPMENT · OVERHEAD CRANES

WHY IRVING BROS. OF HARLAN, INDIANA DECIDED ON A SECOND ERIE PORTABLE TRUCK MIXER PLANT

5 YEARS EXPERIENCE WITH THEIR FIRST UNIT CONVINCED THEM THAT ERIE EQUIPMENT COULD BE COUNTED ON TO DELIVER AS "ADVERTISED"



This is Irving Brothers' new GTES-79 Erie bin and weighing Aggremeter. It's pre-assembled into large sections for easy, over-the-road hauling. No special labor is needed to set it up. And one man can operate it at full capacity, which is 125 yards of specification concrete per hour.

SOLD BY
KORTE BROS. • FORT WAYNE, IND.

In 1948, Irving Brothers Gravel Company bought an Erie Steel Construction Portable Unit for their Harlan, Indiana plant. That was 5 years ago.

This spring, Irving Brothers bought their second plant. The new plant just went into operation.

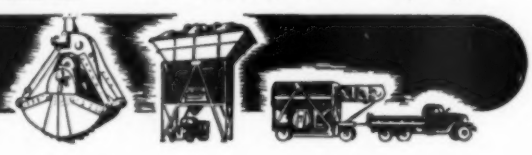
When the second order was placed, James Irving said, "The accurate dependable service and the short time it takes to erect Erie equipment are what prompted us to buy our second Erie plant."

Important as it is, quick knock-down and set-up aren't the only advantages owners get out of their Erie plants. Other features are: accurate, central-plant capacity and fast service on parts.

If you're thinking about a portable batching and mixing plant, don't decide until you get the Erie story. Learn for yourself why most Erie owners repeat with Erie equipment.

ERIE
STEEL CONSTRUCTION COMPANY
3811 GEIST ROAD • ERIE, PENNSYLVANIA

Cable Address: EXIMPORT *Write for Booklet* **GS** *Dept.* **Q73**



GM DIESEL
CASE HISTORY No. 528-84

USER: B.L. Anderson, Cedar Rapids, Iowa.

INSTALLATION: 21 GM Diesels (3, 4, and 6-71's and "Twin" 6-71's) powering shovels, Koehring Dumptors and three portable rock crushers. Firm produces 4,000 to 5,000 tons of road stone per day.

PERFORMANCE: Supt. L.V. Porter reports GM Diesels have reduced fuel and maintenance costs considerably. Overhauls cost less and are needed less frequently. Crushers can run 7" material without stalling engines. Lighter weight of engines has made equipment easier to move.

It pays to STANDARDIZE on

GM
GENERAL MOTORS
DIESEL POWER

CUT CRUSHING COSTS with GM DIESEL POWER

When this company replaced the gasoline engine in a shovel with a General Motors Diesel in 1945, fuel costs dropped 50%. That was B. L. Anderson's first GM Diesel. Now they own 21 units, because they found these engines reduce operating expenses.

The GM Diesel boosts production in all kinds of heavy-duty jobs because smooth 2-cycle operation makes it accelerate faster under load changes. It starts quickly in any weather and operates on a miserly quantity of low-cost fuel. It delivers dependable, economical power for thousands of hours without requiring major repairs.

And when service is needed, you'll find the cost surprisingly low. Compare parts costs with other Diesels, for example, and you'll quickly see what we mean. That's one of the many good reasons why contractors in every field are switching to GM Diesel power.

DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICHIGAN
Single Engines . . . 16 to 275 H.P. Multiple Units . . . Up to 840 H.P.

BUILT TO TAKE ROCK-SHOCK
Double steel floor is reinforced with heavy oak plank to absorb loading shocks. Front and sides are channel ribbed to provide rigidity. Steering jacks and tires are protected from accidental damage by falling rock.

Allis-Chalmers Motor Wagon

built to meet today's high production demands

DUMPS SAFELY . . . CLEANLY — Wheel base remains constant during entire dumping cycle. With this stable wheel base, operator may back to the very edge of a steep fill, set the powerful air brakes on *all four* wheels and put the entire load over the edge.

Clean interior, plus high, 70-degree tilt assures complete load ejection. Body may be heated by exhaust to prevent freezing of materials in severe temperatures.

MULTIPLY TRACTOR USE WITH INTERCHANGEABLE SCRAPER BODY . . . for stripping and other self-loading operations. TS-200 Motor Scraper is a high-speed, rubber-tired unit with 13-yard capacity, "through-the-center" boiling action for easy loading, positive forced ejection and many other high-production features.

Ask your Allis-Chalmers dealer for the full story.

TRAVELS FAST — High horsepower-to-yardage ratio and large, high-traction rock-lug tires give fast average travel speeds — even on adverse grades and heavy going. Delivers more loads per hour; reduces idle shovel time.

ALLIS-CHALMERS MODEL TR-200 REAR-DUMP MOTOR WAGON

Choice of Engines—165 hp. Cummins; 176 hp. Buda.
Capacity — 15 cu. yd., heaped; 18 tons.
Speeds — Five forward to 21.6 mph.; reverse to 2.5 mph.
Hydraulic steering and dumping.

ALLIS-CHALMERS

TRACTOR DIVISION · MILWAUKEE 1, U. S. A.

Profits . . .

. . . Within your grasp . . . with

A TYPE & SIZE
FOR
EVERY DIGGING PURPOSE

HENDRIX BUCKETS

3/8 to 40 Cubic Yards

HENDRIX Lightweight DRAGLINE BUCKETS

Hendrix Buckets Also Available Without Perforations On Special Order Only

HENDRIX MANUFACTURING CO., INC.

MANSFIELD – LOUISIANA

Another Example of
Profitable Non-Metallic Beneficiation
with Heavy-Media Separation

Read How
Kaiser Aluminum and Chemical Corporation
Up-grades Dolomite, Reduces "Selective Shoveling,"
Increases Output and Improves Quarry Efficiency
with this pre-fabricated H.M.S. Plant

Kaiser Aluminum and Chemical Corporation imposes a very tough specification on its Nativadad (California) Dolomite Plant—less than 1% silica and not less than 98% dolomite from a deposit of dolomitic limestone intruded by large dikes and sills of high-silica granite!

To produce acceptable kiln-feed it had been necessary to by-pass large dikes and sills or to mine out and discard these high-silica intrusives as waste. "Selective shoveling" made quarrying operations, difficult, costly. At one time, only 38% of the mined material was usable. Beneficiation, too, posed a problem because the specific gravity of acceptable product is within 0.10 of the high-silica waste.

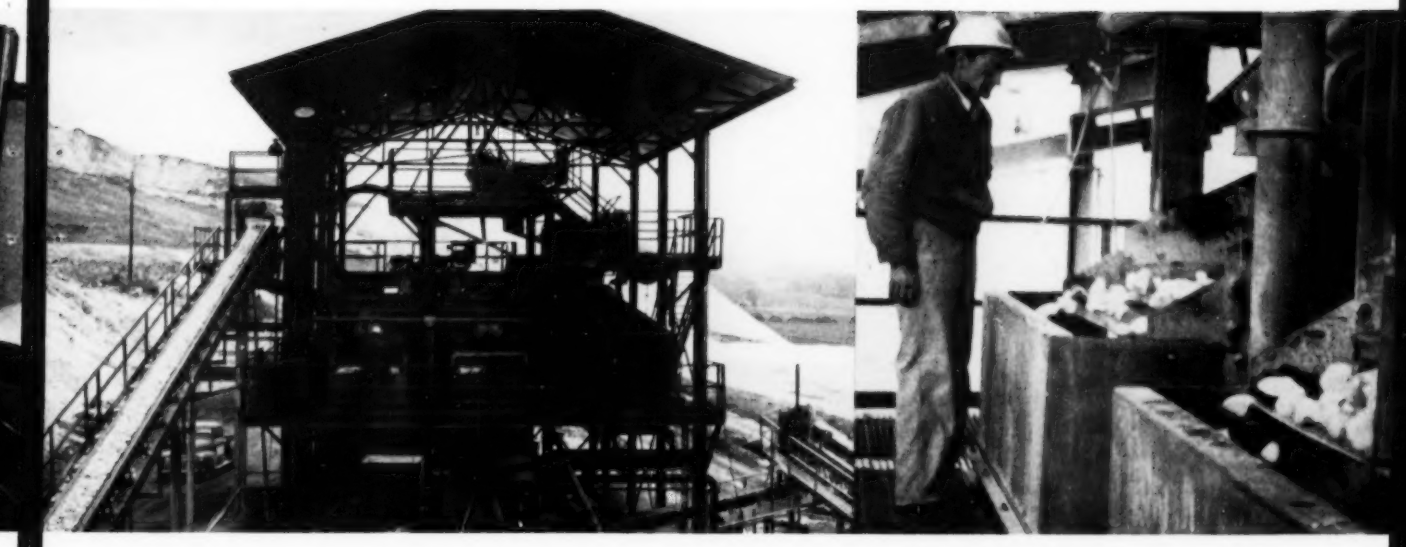
To solve this difficult operating and economic problem, Kaiser installed a 250 tph Heavy-Media Separation plant. Result: A more uniform, low-silica product; better kiln operation, and lower costs all along the line. Typical analyses of end product now show silica approximately 0.3% from a feed running as high as 7.7% and averaging 2.7 SiO_2.

Over 55% of the quarry output now becomes usuable kiln feed . . . a marked gain in quarry efficiency. Ore reserves have been increased. Lower-grade material can now be beneficiated. "Selective shoveling" has been materially reduced with concurrent gains in output and quarry costs.

Treating 4 x ¼" feed with a ferrosilicon-magnetite mixture as the separating medium, this pre-fabricated Heavy-Media Separation plant operates at 2.65 specific gravity. Medium-loss averages well under a half-pound per ton of kiln-feed recovered. Capital costs were minimized by pre-fabricated construction. Operating and labor costs are low.

AMERICAN Cyanamid COMPANY

MINERAL DRESSING DIVISION 30 ROCKEFELLER PLAZA NEW YORK 20, NEW YORK



This is but one of many examples of non-metallic minerals now being beneficiated by Processes and Reagents offered by Cyanamid. Quickly and at low capital cost, you may be able to improve output, cut costs or make "sub-marginal" deposits workable through accurate, low-cost concentration employing one of these processes.

Cyanamid offers a choice of processes covering a full size-range: Heavy-Media Separation, 6 x ¼"; Dutch States Mines Cyclone Separator, ⅜" x 65 mesh, and Froth Flotation, 65 mesh x 0. Test results, design data and operating experience are available to assure predictable performance in minimum time at the lowest cost.

First step to more profitable operation is a discussion of your problems and objectives with a Cyanamid Field Engineer. Your letter or telephone call – or the convenient coupon – will have prompt and intelligent attention.

☐ *We are interested in data on the beneficiation of the non-metallic minerals ringed below:*

ANDALUSITE	FLUORSPAR	KYANITE	RHODOCHROSITE
BARITE	GARNET	MAGNESITE	SALT
CEMENT ROCK	GLASS SANDS	MANGANESE	SILLIMANITE
COAL	GRAPHITE	MICA	SCHEELITE
CHROMITE	GRAVEL	OLIVINE	SPODUMENE
DIAMONDIFEROUS GROUND	GYPSUM	PEARLITE	VERMICULITE
FELDSPAR	ILMENITE	PHOSPHATE ROCK	WOLFRAMITE
	IRON OXIDES	POTASH	(OTHER)

☐ *Send a copy of "Mineral Dressing Notes #19 – Heavy-Media Separation Processes for Mineral Concentration"*

Name _____

Address _____

_____

PRINTED IN U.S.A.

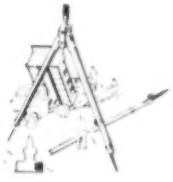
MARION Rock bodies stand up Under a shovel!

It takes a tough body to stand daily shovel loading. That's why more operators are putting Marion's into service. On-the-job experience has shown that Marion bodies are built to withstand the severe beating and hard knocks of heavy off-the-road haulage service.

Marion engineers have combined the finest materials available with modern advanced design... to produce the most efficient, trouble-free heavy dumping units on the market. And Marion's built-in durability means consistent performance . . . longer life, and lower upkeep.

A Marion body and hoist makes a good truck — *better!* Your nearby Marion Distributor can give you all the facts—or write direct today.

"Designed on the Job"



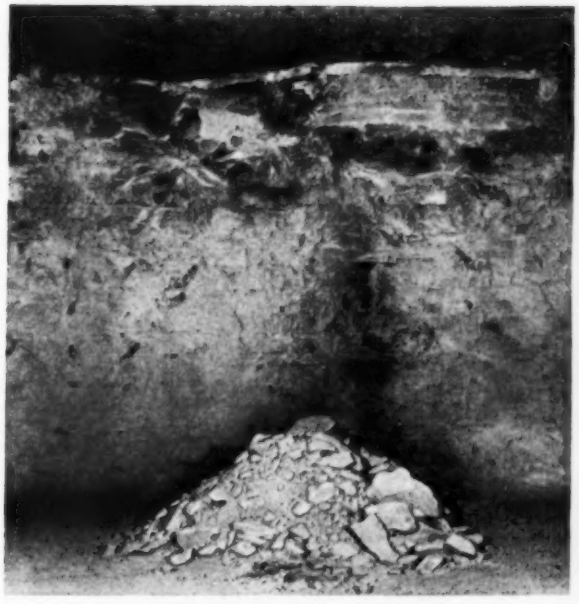
MARION BODIES AND HOISTS

MARION METAL PRODUCTS CO.
Marion, Ohio, U. S. A.

A complete line of standard and special Hydraulic Hoists and Dump Bodies for heavy-duty service

UNIFORM FRAGMENTATION

with Du Pont "Extra" Dynamite and "MS" Delay Caps in underground limestone quarry



Face drilled and ready for loading in Franklin Underground Quarry.

Results with "MS" Caps consistently produce more uniform fragmentation.

● Rooms average about 26 feet high . . . 48 feet wide in the underground limestone quarry of the Franklin Limestone Company, Franklin, Tennessee.

Typical shots consist of some 48 holes arranged in vertical rows of six each. These are loaded with Du Pont "Extra"® D-1 Dynamite (40%) and are primed with Du Pont "MS"* Delay Electric Blasting Caps of 25, 50, 75, 100, and 125 millisecond delay periods.

"MS" Caps enable the operators to use less dynamite per blast and to obtain a much better and more uniform quality of fragmented rock. In addition, these caps greatly reduce concussion throughout the mine.

Whatever type of blasting you may be supervising . . . you can always depend on Du Pont Explosives to deliver the best results possible. Ask the Du Pont Explosives representative in your own district for complete information and for technical assistance whenever you may have a special problem. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

*"MS" Delay Electric Blasting Caps are available in 19 millisecond delay intervals: MS-25, -50, -75, -100, -125, -150, -175, -200, -250, -300, -350, -400, -450, -500, -600, -700, -800, -900 and -1000.

DU PONT EXPLOSIVES

Blasting Supplies and Accessories

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

where

MISALIGNMENT

can't be helped . . .

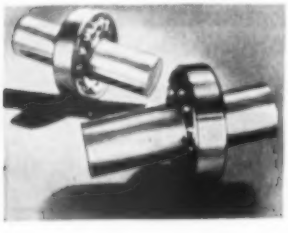
you'll find

SKF

Spherical

Roller Bearings

See how the raceway of the outer ring of this SKF Spherical Roller Bearing forms a section of a sphere. This principle of design of the SKF self-aligning bearings compensates for misalignment due to shaft deflection under load, distortion of the foundation, or other causes.



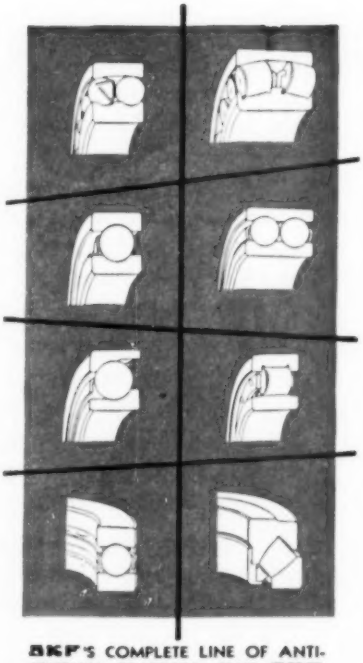
This illustration shows how the principle is also applied to ball bearings, enabling SKF Bearings to operate satisfactorily at high speeds even when some shaft misalignment exists. (The misalignment is exaggerated for clarity.)

Suitable for very heavy radial and thrust loads, SKF Spherical Roller Bearings, like all SKF Bearings, are held well within established tolerance limits, carefully cleaned, protected from rust, and available with cylindrical and taper bores and adapter mountings.

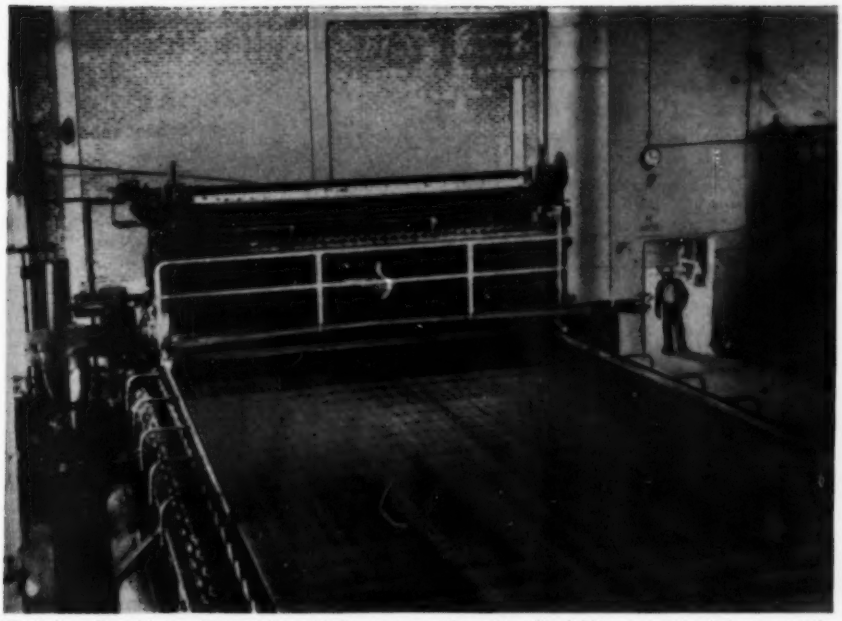
SKF bearings are serving virtually all industry. SKF's unmatched Field and Home Office engineering service helps product designers *put the right bearing in the right place.* **SKF INDUSTRIES, INC.,** PHILADELPHIA 32, PA. — *manufacturers of* **SKF** *and* HESS-BRIGHT *bearings.* 7403

SKF®

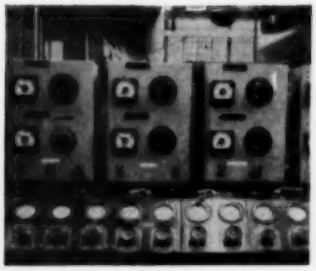
BALL AND ROLLER BEARINGS



SKF'S COMPLETE LINE OF ANTI-FRICTION BEARINGS, PLUS **SKF** ENGINEERING CO-OPERATION, HELPS YOU *PUT THE RIGHT BEARING IN THE RIGHT PLACE.*



Block-long Fourdriniers sitting side by side turn out an endless strip of kraft 24 hours per day, 7 days per week, 365 days per year. At "wet end" above, kraft is 96% water, 4% pulp. Scene is at modern Florida mill where Hudson Multiwall Sacks are made.



Automatic controls safeguard every foot of kraft manufacture, to assure that your exacting specifications are fully met.

At "dry end" of Fourdrinier, water content has been reduced to proper 6%. Crane removes kraft for rewinding, slitting, and humidity-guarded storage.

Here is why HUDSON can guarantee Multiwall Sacks against breaking on your packer

REASON NUMBER 3 HUDSON MAKES ITS OWN KRAFT

Last year this Hudson mill made enough kraft to lay a 20-foot strip several times around the world. Hudson is a veteran of 31 years in kraft manufacture...but its Multiwall Sack mill is virtually new—with outstandingly advanced equipment.

By making its own kraft, Hudson exerts iron-clad control of Multiwall Sack quality and delivery schedules. This is another reason why Hudson guarantees to replace *without cost* all Hudson Multiwall Sacks that fail on your packing or closing machines.

HUDSON

MULTIWALL SACKS

SEND TODAY: How to store your sacks for maximum performance

Profusely illustrated folder shows you the scientific way to store your sacks. Step by step procedures that improve the performance of your sacks by up-to-minute storage methods. No obligation.

MAIL THIS COUPON NOW to Hudson Pulp & Paper Corp., Dept 106, 505 Park Ave., New York 22, for literature and full information.

NAME _____

COMPANY _____

STREET _____

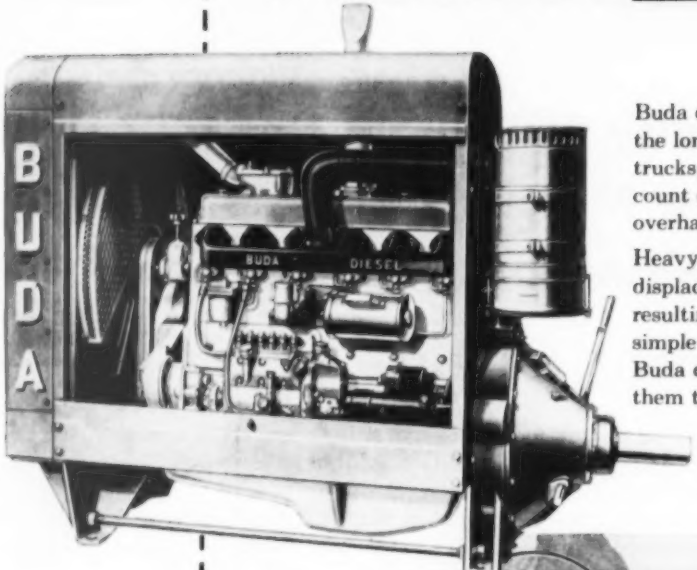
CITY _____ ZONE ____ STATE _____

HUDSON PULP & PAPER CORP., Dept. 106, 505 Park Avenue, New York 22, N.Y.

BUDA DIESELS

average 6000 hours

before overhaul in toughest service



Buda dyna-swirl Diesels are heavy duty built for the long run. Whether they power crushers, trucks, scrapers, shovels or dozers—you can count on an average 6000 or more hours before overhaul. This means money in your pocket.

Heavy duty construction . . . . 10 to 17% greater displacement . . . . controlled turbulence combustion resulting in lower peak pressures . . . . "clean" simple design with fewer parts are only a few Buda dyna-swirl Diesel advantages that make them the longest-life engines in the business.

Ask your nearby Buda Engine Distributor to prove Buda Diesel Superiority today. There's no obligation. Write for illustrated Bulletin and data. The Buda Co., Harvey, Illinois

Buda 844 Diesel engine powering Telsmith Crusher

BC-25

BUDA *a Power-Full and Dependable Engine FOR EVERY NEED*

7 out of every 10

are repeat orders

ALLIS-CHALMERS GRINDING MILLS

OPERATING MEN who have had actual experience with Allis-Chalmers grinding mills will usually specify A-C mills again . . . as proved by our sales records.

Repeat orders, of course, come only from customers who have been well satisfied. That's why we're proud of the fact that 7 out of 10 new Allis-Chalmers grinding mills go to operators for whom we have supplied mills in the past.

Ask the Allis-Chalmers representative in your area about the many high output and low maintenance advantages of Allis-Chalmers grinding mills. Or write for Grinding Mill Bulletin 07B6718A. Allis-Chalmers, Milwaukee 1, Wisconsin. A-3845

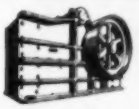
ALLIS-CHALMERS

A-C ALLIS-CHALMERS

Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.

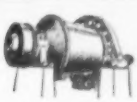
Hammermills

Vibrating Screens



Jaw Crushers

Gyratory Crushers



Grinding Mills

Kilns, Coolers, Dryers

BAY CITY

...does it better

STOCK PILING

EXCAVATING

For profitable digging, stockpiling or loading, your best bet is a BAY CITY. These powerful, efficient machines keep daily production high while maintenance and operating costs remain relatively low. BAY CITY Crawler and rubber-tire mounted machines are built from ground to boom-point for rugged, heavy-duty service. They are bigger, more powerful and better balanced when compared with other machines of the same rated capacity. They incorporate engineering and construction features that mean greater all-around operating efficiency. Many BAY CITY machines have been on the job for 25 years or more—and are still giving service. See your BAY CITY dealer or write us today for the complete story about BAY CITY Shovels and Crane-Wagons.

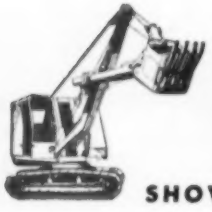
BAY CITY SHOVELS, INC., BAY CITY, MICHIGAN

LOADING

221

write for this catalog

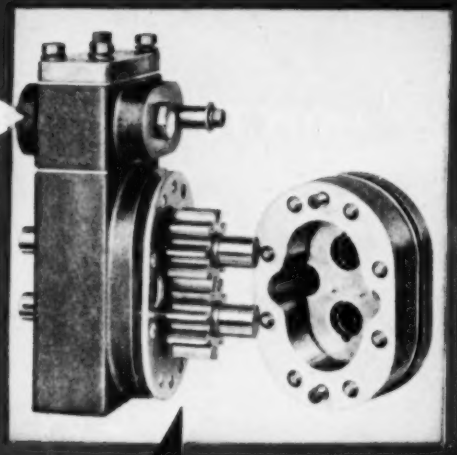
This free catalog #3745-B describing the ¾-yard BAY CITY Shovel is packed with valuable information, pictures of parts and assemblies, and typical applications . . . yours for the asking. For complete information about the self-propelled 25-ton CraneWagon for use as Crane, Clamshell or Dragline, ask for Bulletin 190CW-C.



BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

THE BIG DIFFERENCE *HERE*



MAKES A BIG DIFFERENCE *HERE!*

NOW A NEW CONCEPT of DUMP TRUCK PERFORMANCE from Gar Wood

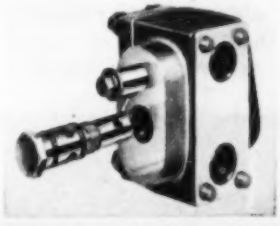
Now, from Gar Wood, here's a complete new line of advance-engineered, precision built hydraulic pumps destined to bring Gar Wood owners a brand new concept of heavy-duty hydraulic hoist performance . . . pumps designed and field tested for levels of hydraulic efficiency never before achieved by any manufacturer.

Gar Wood's new three-piece pump housing design eliminates gear alignment problems inherent in other pumps having counterbored gear shaft mountings. Closer tolerances can be held in production . . . results in precision manufacture and assembly never before possible . . . assures longer life and greatly improved performance in actual field service. New 10-tooth pump gears have larger, stronger teeth with gear width and diameter scientifically calculated to provide increased oil flow at all speeds. Increased pump output assures fast, positive hoist action with instant response to hoist controls for most efficient dumping of heavy loads.

Gear shaft sizes have been increased to provide greater strength and more rigid gear mounting . . . shafts cannot deflect under heavy loads to cause improper meshing of gears. Tooth contact is positive under all load conditions—spalling and premature wear from incorrect alignment are eliminated. Shafts are mounted in large needle roller bearings with increased load capacity for long life and quiet operation. Precision machined aluminum wear plates prevent side play in gears—eliminate scuffing and resultant gear failure. Special alloy steel bolts hold pump assembly permanently rigid . . . assure permanent, positive alignment. Alloy steel bolts cannot stretch to permit oil leakage and thus impair hydraulic efficiency. Field service is simplified too, since all housing faces are mirror-finished to permit leakproof assembly *without gaskets* . . . no hand fitting of parts is required.

For profits' sake, investigate heavy-duty Gar Wood hoists featuring the new line of Gar Wood hydraulic pumps. A complete line of heavy-duty pump sizes and capacities assures the right pump for every heavy-duty Gar Wood hoist—and you'll discover a new level of hydraulic efficiency and heavy-duty hoist performance never before available to truck owners and operators. See your local Gar Wood Distributor or use the coupon below to obtain full information.

New, precision built, balanced spool valve ends creeping . . . permits positive positioning of dump body by cab control without binding. Valve mounts on either end of pump for simple conversion to right or left hand drive. One-piece "unit" construction of ball check assembly permits easy inspection and replacement when necessary.



Customer Service Department, 3A114
GAR WOOD INDUSTRIES, Inc.,
36012 Main St., Wayne, Michigan

Please send me complete information on the new line of Gar Wood Hydraulic Pumps for heavy-duty service.

Name and Title _____

Company _____

Address _____

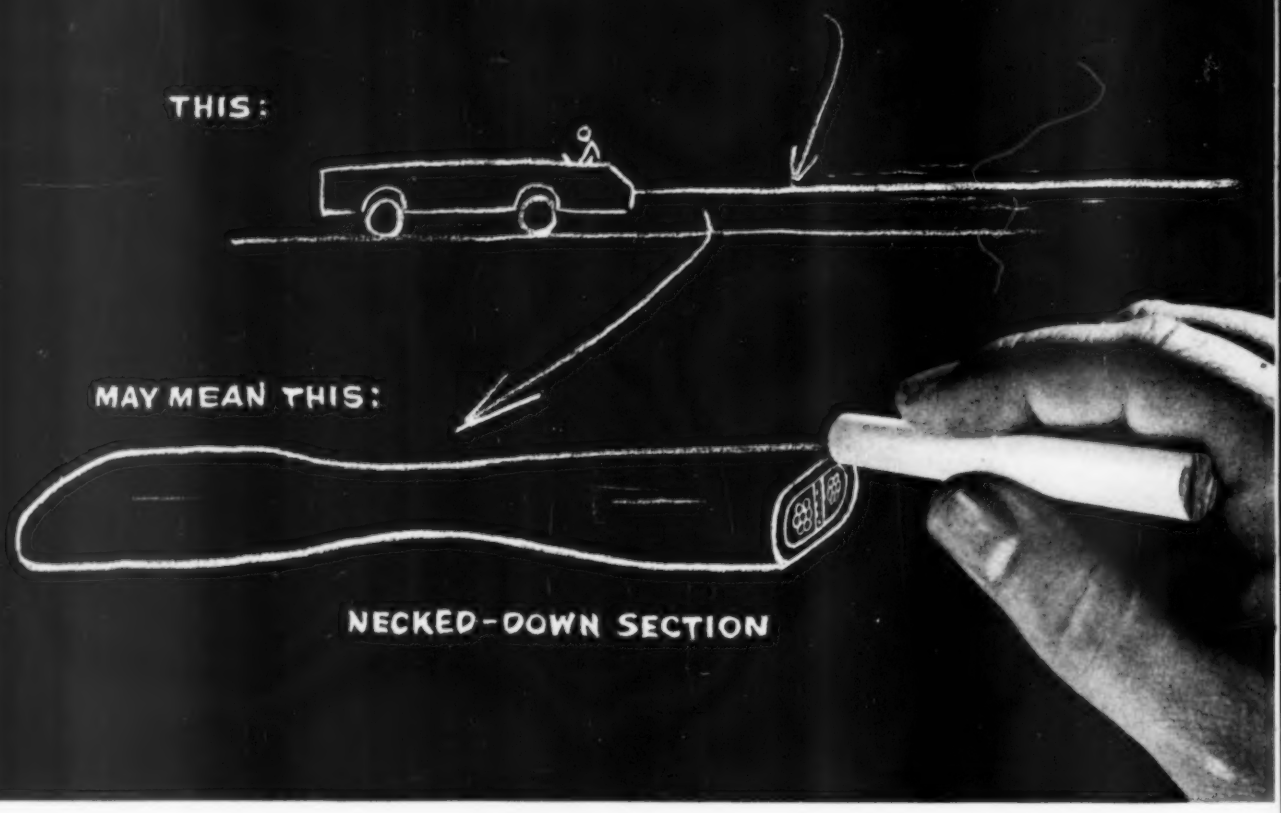
City _____ Zone _____ State _____

GAR WOOD INDUSTRIES

GAR WOOD INDUSTRIES, INC.
WAYNE, MICHIGAN

TRUCK EQUIPMENT: Dump Truck Bodies and Hoists, Winches and Cranes, Refuse Collection Bodies, Elevating End-Gates.
CONSTRUCTION EQUIPMENT: Excavators, Scrapers, Dozers, Ditchers, Spreaders, Finegraders, Truck-Mounted Road Graders.

HOW TO SPOT DAMAGE FROM TOO MUCH TENSION



. . . AND WHY ANACONDA'S NEW BALANCED DESIGN ADDS SAFETY, LONGER LIFE TO CABLE

Necked-down cable shows overstretching. Jacket and insulation become thin, easily punctured. Moisture penetration or a broken ground conductor may make the cable hazardous.

ANACONDA'S ANSWER: BALANCED DESIGN

Tension devices help; but aren't cure-alls. An added safeguard lies in the balanced design of Anaconda's new mining-machine cable. Stretchability of the ground has been increased. It will not break before the power conductors. A new neoprene jacket has higher compression-cutting resistance and tensile strength. In the insulation more strength and moisture resistance are obtained from a cold-rubber base . . . similar to that used by tire makers to mold a tougher tire. Stranding, too, has been redesigned to make the whole cable more flexible . . . at no greater cost. You get less trouble from tearing, cutting, gouging and abrasion caused by rib-pinching, runovers and dragging.

MUCH LONGER AVERAGE LIFE

In shuttle cars recently surveyed in 15 mines, ANACONDA Cables last 3 times as long as cables made only a few years ago. To learn why this is so, ask your nearest Anaconda Sales Office or Distributor for a sample section of this new cable. Examine it . . . take it apart. And remember that no ANACONDA Mine Cable has ever failed a U. S. Bureau of Mines flame test. *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.* 53390

ANACONDA®

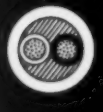
TODAY'S HEADQUARTERS FOR MINE CABLE

FLAT TWIN CABLES FOR:
shuttle cars
continuous miners
loaders cutters
drill trucks

HI-VOLT CABLES FOR:
mine power

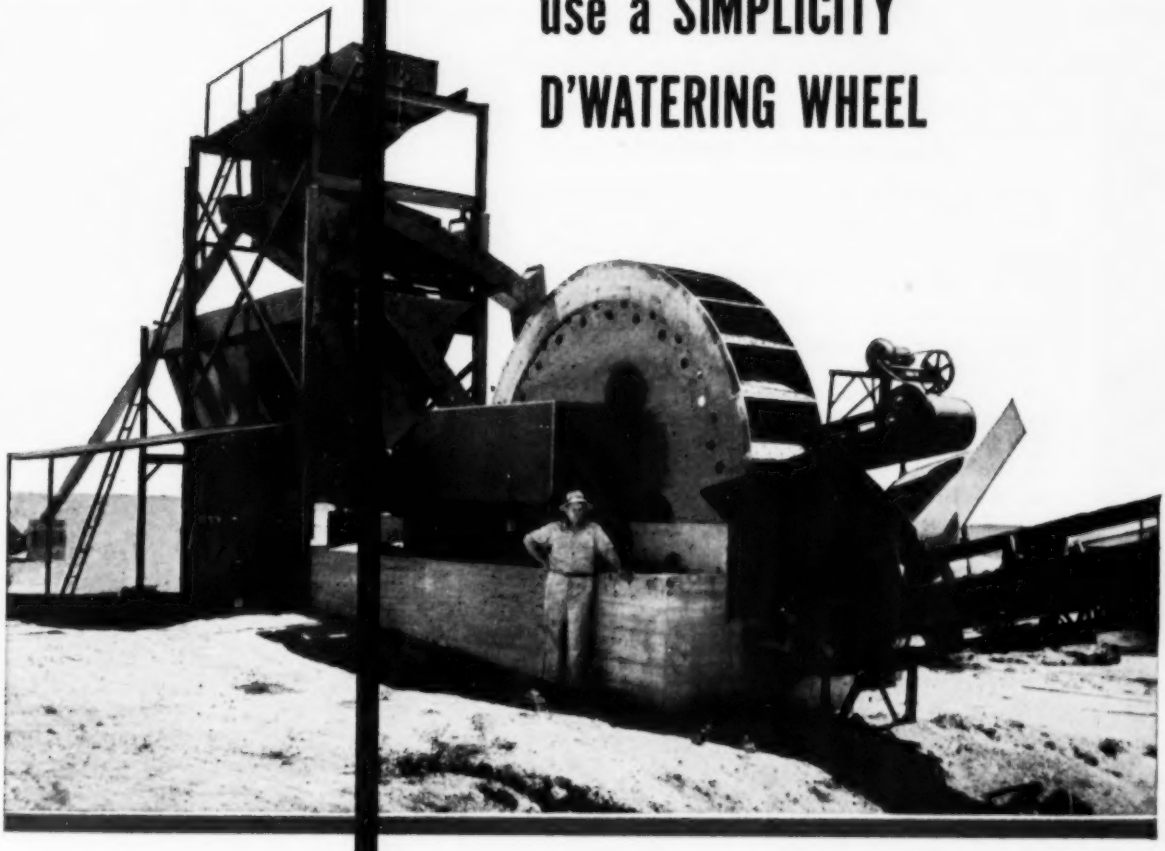
TYPE SH-D FOR:
shovels

TYPE SO FOR:
hand drills
remote control



TROLLEY WIRE
FEEDER CABLES
TELEPHONE WIRE
SHOT FIRE CORD
WELDING CABLES

There's no cheaper method of dewatering sand or gravel . . . use a SIMPLICITY D'WATERING WHEEL



In the installation shown here, a Simplicity D'Watering Wheel is teamed up with a Double Deck Simplicity Gyrating Screen to provide fast, low-cost sizing, separating and dewatering of sand and gravel. The screen separates the gravel from the sand and deposits sand in the tank of the D'Watering Wheel. Then the Wheel lifts the sand from the tank, reducing the moisture content to 12% in the process, and delivers it to a fast-moving inclined conveyor belt. One simple power unit is all that is necessary. Maintenance and operating costs are virtually eliminated, thus making the Simplicity D'Watering Wheel more economical than any other device for dewatering sand and gravel. Simplicity D'Watering Wheels are available in 2' and 3' widths with 14' diameters. For more information about this economical equipment, consult a Simplicity sales engineer or write us today.

SALES REPRESENTATIVES IN ALL PARTS OF THE U.S.A.

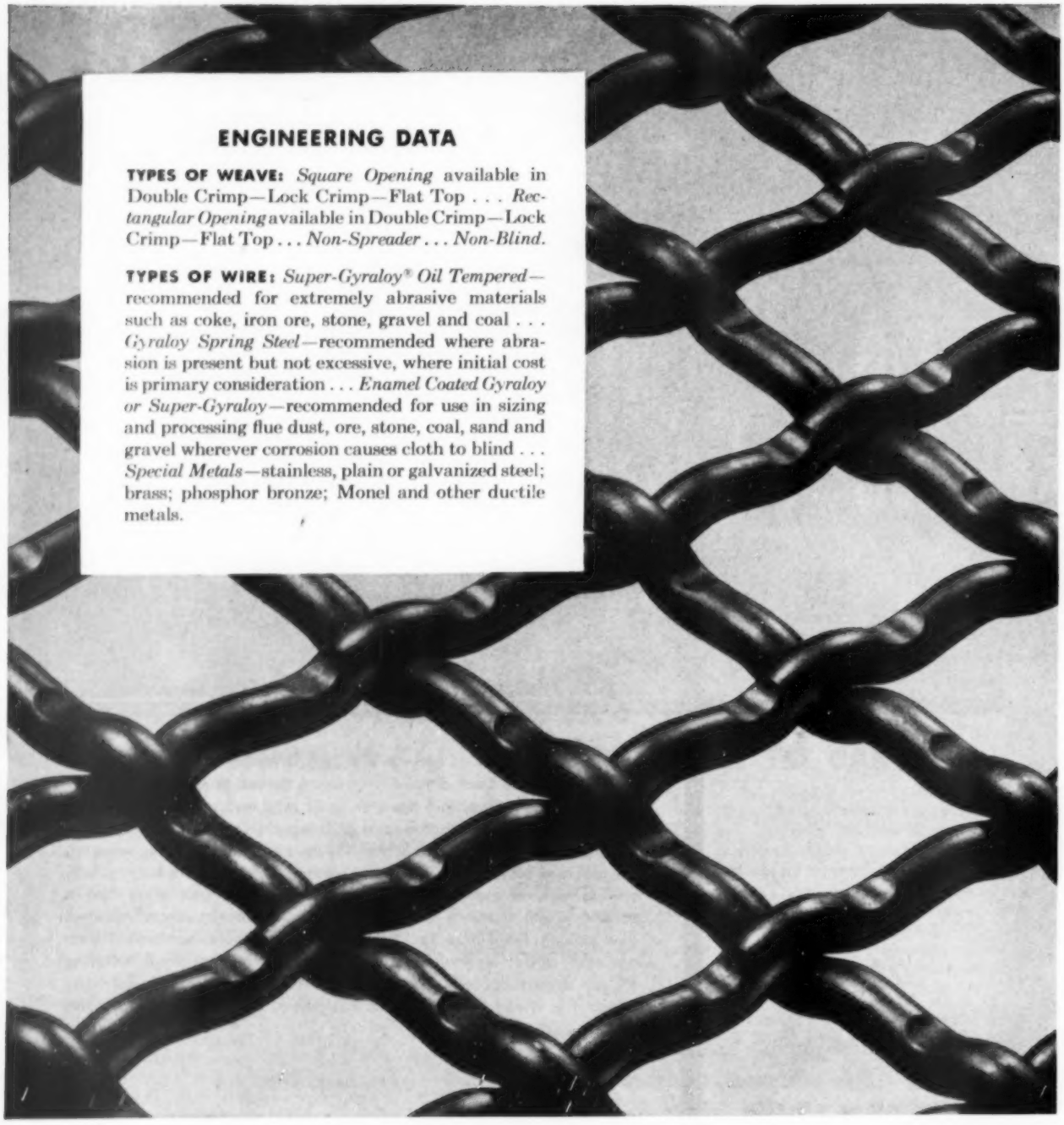
FOR CANADA: Canadian Bridge Engineering Co., Ltd., Walkerville, Ontario

FOR EXPORT: Brown & Sites, 50 Church Street, New York 7, N.Y.

Simplicity
TRADE MARK REGISTERED

ENGINEERING COMPANY • DURAND, MICHIGAN

We'll Give You Better



ENGINEERING DATA

TYPES OF WEAVE: *Square Opening* available in Double Crimp—Lock Crimp—Flat Top . . . *Rectangular Opening* available in Double Crimp—Lock Crimp—Flat Top . . . *Non-Spreader* . . . *Non-Blind.*

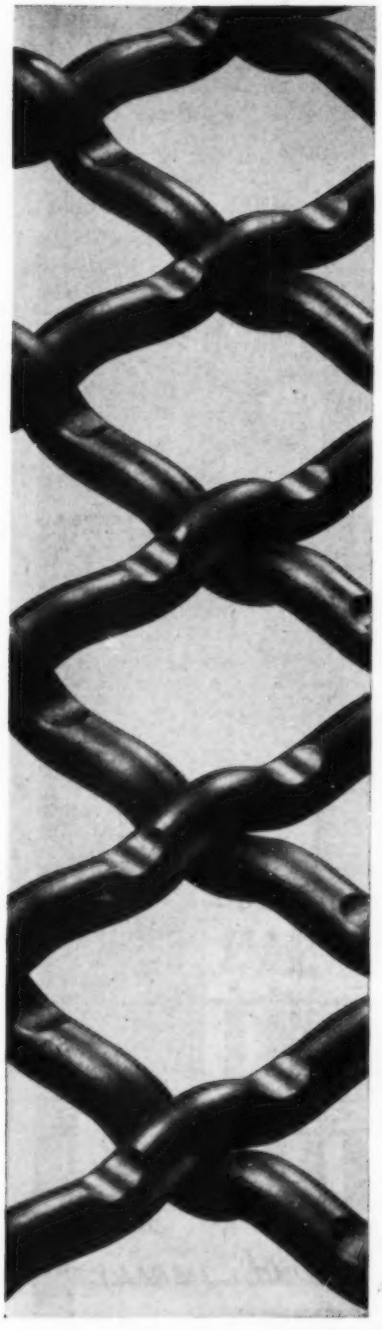
TYPES OF WIRE: *Super-Gyraloy® Oil Tempered*—recommended for extremely abrasive materials such as coke, iron ore, stone, gravel and coal . . . *Gyraloy Spring Steel*—recommended where abrasion is present but not excessive, where initial cost is primary consideration . . . *Enamel Coated Gyraloy or Super-Gyraloy*—recommended for use in sizing and processing flue dust, ore, stone, coal, sand and gravel wherever corrosion causes cloth to blind . . . *Special Metals*—stainless, plain or galvanized steel; brass; phosphor bronze; Monel and other ductile metals.

HEWITT-ROBINS INCORPORATED

HEWITT-ROBINS

EXECUTIVE OFFICES, STAMFORD, CONNECTICUT

Screen Cloth Delivery



Increased Production Capacity Assures Faster Delivery For All Types Of Hewitt-Robins Screen Cloth

Now, we can give you faster delivery—*direct from our own modern plant*—of the finest quality screen cloth to meet your every need . . . Screen Cloth that gives you longer life, greater satisfaction on any type of screen, regardless of make . . . Screen Cloth that will provide you with highest efficiency, lowest cost per ton.

For shorter delivery on any type of Hewitt-Robins screen cloth send us this information:

1. Type of screen—Name of manufacturer—Model of machine.

2. Kind of screen cloth desired: Specify type *weave*—type of *wire*.

3. Size of clear opening or mesh and wire diameter.

4. Type of edge formation: Flat edges — Welded — Reinforced hook strips.

5. Length and width of panels (width measured from outside to outside of bent hooks)—Height and length of hook strips—Degree of angle inside of hook.

6. For rectangular, non-spreader or non-blind openings: Specify direction of long slot (which dimension of cloth it parallels).

7. For dewatering decks: Size of openings in mm—Single, double or no depressions—Round or triangular profile stainless steel rods.

WRITE FOR SCREEN CLOTH BULLETIN No. 113-A1

CHECK FOR INFORMATION ABOUT THESE JOB-TESTED PRODUCTS FOR YOUR OPERATION

CONVEYORS:
- ☐ —Belt
- ☐ —Sectional
- ☐ —Mine
- ☐ —Shuttle
- ☐ —Vibrating

BELTING:
- *☐ —General Conveyor
- *☐ —Raynile®
- *☐ —Elevator
- ☐ —Woven Wire
- ☐ BUCKET ELEVATORS
- ☐ IDLERS

SCREEN CLOTH:
- ☐ —General
- ☐ —Electrically Heated

VIBRATING SCREENS:
- ☐ General
- ☐ Dewaterizers
- ☐ Heavy-Duty Scalpers
- ☐ Slip Lawn

HOSE:
- *☐ Twin-Weld®
- *☐ Servall®
- *☐ Fire
- *☐ Steam
- *☐ Air
- *☐ Water
- *☐ Pinch-Valve
- *☐ Flexible Rubber Pipe
- ☐ MECHANICAL FEEDERS
- ☐ STACKERS
- *☐ GROOVED PULLEY LAGGING
- ☐ SELF-UNLOADING BOATS
- ☐ DESIGN AND CONSTRUCTION OF COMPLETE MATERIALS HANDLING SYSTEMS

*For immediate information about these industrial rubber products, call your Hewitt Rubber Distributor. (See "Rubber Products" Classified Phone Book).

Hewitt-Robins Incorporated
666 Glenbrook Road
Stamford, Connecticut

NAME

TITLE & COMPANY

STREET ADDRESS

CITY PO ZONE STATE

INCORPORATED

DOMESTIC DIVISIONS: Hewitt Rubber • Robins Conveyors • Robins Engineers • Restfoam
FOREIGN SUBSIDIARIES: Hewitt-Robins (Canada) Ltd., Montreal • Hewitt-Robins Internationale, Paris, France • Robins Conveyors (S. A.) Ltd., Johannesburg • **EXPORT DEPARTMENT:** New York City.

AMERICAN Container-Cartridges Clearly End-Labeled

AC-55
DYNAMITE
25 LBS. 5 x 30
N-5820

FOR EASIER SELECTION!

American Explosives' popular 25-lb. shipping-loading container-cartridges are now easier to use than ever.

Strapped in bundles of two for shipping and handling convenience, each cartridge is clearly end-labeled so that you can choose the right strength for the shot.

Experienced shooters know that there's nothing like these American container-cartridges for easy loading, sure shooting and for bringing down just the right breakage. Available in a wide variety of densities, velocities and strengths, American Explosives are in stock at plants and magazines in key spots throughout the country. Next time order American!

Capable Field Engineers Are Available At Your Call

High Explosives • Permissibles • Blasting Powder • Blasting Accessories

AMERICAN CYANAMID COMPANY
EXPLOSIVES

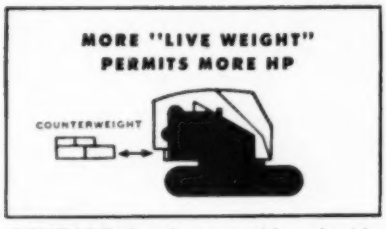
AMERICAN Cyanamid COMPANY
EXPLOSIVES DEPARTMENT
30 Rockefeller Plaza, New York 20, N. Y.
Sales Offices: Pittsburgh, Pa., Bluefield, W. Va., Scranton, Pa., Chicago, Ill., Pottsville, Pa., Maynard, Mass.

Before you buy:

COMPARE NET HP!

This LS-85, despite tough, big-chunk rock, has been operating over 1200 hours without requiring one replacement part!

Don't judge available power by engine model only ... NET hp is what adds up to extra profit!



COMPARE shovel-cranes with and without counterweight. That test spotlights the size, weight and heft built into the working parts and structural members. You'll find the LS-85 has more "live weight" than comparable ¾-yard shovel-cranes.

Greater net horsepower assures faster, deeper digging. Bigger loads are handled without stalling. For example: the diesel driven heavy-duty ¾-yard LS-85 packs 92 net hp. That's more power than comparably-sized competitive rigs can safely use. It's why the LS-85 has more digging force behind its bucket teeth . . . why it cuts so smoothly . . . hoists and swings without a pause.

Use of greater net hp is practical because of all-welded, stress-relieved construction *and extra "live weight."* This *extra live weight* is in heavier, sturdier working parts and structural members—rather than a heavier counterweight. All this means year-after-year service and low maintenance costs. So whatever you do, don't compare power by the engine model only—CHECK *NET* HP.

For more facts on the LS-85, ask your distributor, or write for Catalog 2317. For the complete line, request Catalog 2373.

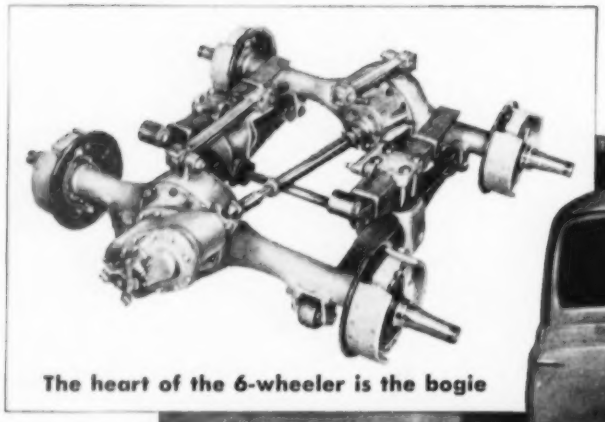
LINK-BELT SPEEDER CORPORATION
Cedar Rapids, Iowa

13.240

LINK-BELT SPEEDER
CORPORATION
BUILDERS OF A COMPLETE LINE OF CRAWLER, TRUCK AND WHEEL-MOUNTED SHOVEL-CRANES

FACTORY-TRAINED DISTRIBUTOR SALES AND SERVICE SPECIALISTS ...*EVERYWHERE*

INTERNATIONAL LEADS 6-WHEELER FIELD



The heart of the 6-wheeler is the bogie

Proved performance

makes the sales leader

your best buy

Proved bogie design. International RF-210 Series, GVW ratings, 37,000 to 45,000 lbs. Gasoline, LPG or diesel power.

"Tough Job" engineering has made International Trucks the heavy-duty sales leader for 21 years. International 6-wheelers give you proved performance PLUS the famous International bogie with the third differential.

INTERNATIONAL BOGIE ADVANTAGES

The third differential and power divider allow each wheel to rotate independently. There is practically no tire scuffing, "axle fight" or power loss. Perfect matching of tires is unnecessary. Fuel consumption is lower. Under adverse conditions, the third differential can be locked out, giving positive traction to both axles.

Abnormal tire wear eliminated because International bogie design *always* keeps wheels parallel to frame.

Reduces road shock by 50%. "Walking action" design keeps chassis frame and body level while bogie "walks" over obstructions and levels out the road.

Extra strength without extra weight. More payload per pound of chassis weight results from elimination of unnecessary dead weight. Strength is concentrated where needed.

Load stresses equalized. Load is carried from the frame to the axles at *four* points.

Compare performance . . . value . . . and price. Get all the facts on International 6-wheelers—*proved* for top performance and greater operating economy—from your International Dealer or Branch today.

INTERNATIONAL HARVESTER COMPANY · CHICAGO

23 New 6-Wheel Models. GVW ratings, 22,000 to 90,000 lbs. Engines from 130 to 356 horsepower. Choice of gasoline or LPG fuel systems. Diesel engines available for models with GVW ratings of 30,000 lbs. and over. Transmissions, axle ratios for any needs. America's Most Complete Line—168 basic models from ½-ton pickups to 90,000 lbs. GVW off-highway models.

International Harvester Builds McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

Better roads mean a better America

INTERNATIONAL TRUCKS

"Standard of the Highway"

"For branch lines I use a half-hitch—pulled up tight

"The detonating wave travels along the Primacord at about four miles per second. At that speed it must pass from the trunk line into each branch 'down-hole' line, where it detonates the charges.

"You can see why these branch connections are important—why they all have to be *tight* and at right angles to the trunk line. And that's where textile-covered Primacord has a big advantage. You can easily make these branch line connections with simple half hitch knots that can be drawn up tight and will stay that way."

Ask your explosives supplier or write for further facts to

THE ENSIGN-BICKFORD COMPANY
Simsbury, Connecticut
Also Safety Fuse Since 1836

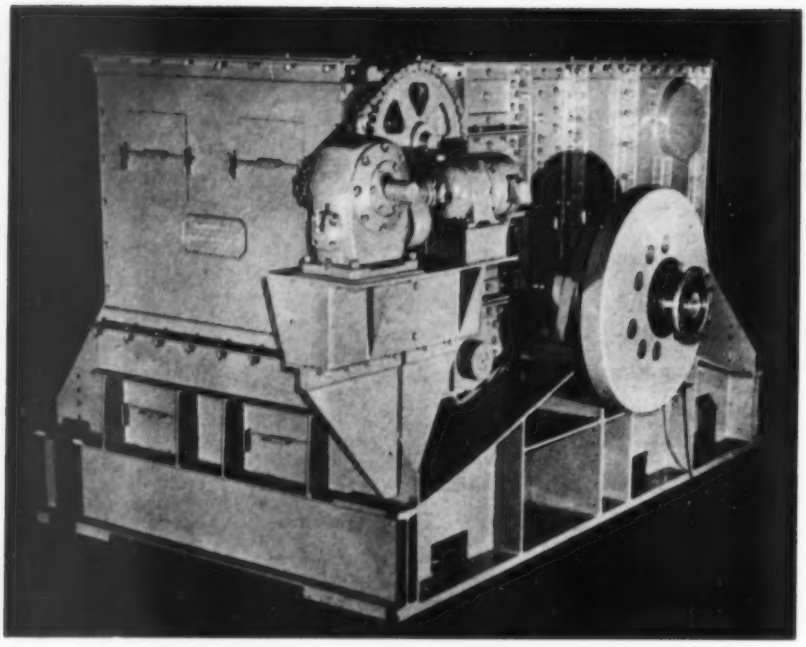
Reinforced Primacord (for deep holes and resistance to abrasion) connects with the **Plain Primacord** trunk line with a simple half hitch, pulled up tight. The textile covering grips securely.

Use the brand of Primacord that meets your needs exactly. In addition to those mentioned, there are: **Wire Countered Primacord,** for deep, ragged holes; and **Plastic Reinforced Primacord,** for deep holes and unusual wet conditions.

Use PRIMACORD®

The PROVED and APPROVED DETONATING FUSE

P-4



ONE STAGE or SECONDARY BULLDOG HAMMERMILLS

•

NON-CLOG MOVING BREAKER PLATE

•

STATIONARY BREAKER PLATE

•

IMPACTOR TYPE

•

PERFORMANCE RECORD!

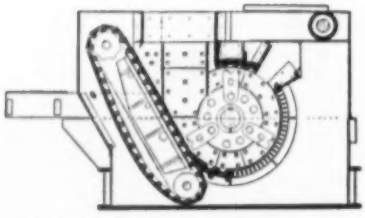
Prepare cement rock — shale — clay to increase raw mill capacity.

Let us demonstrate how many cement operators increased capacity with present equipment.

BULLDOG HAMMERMILLS

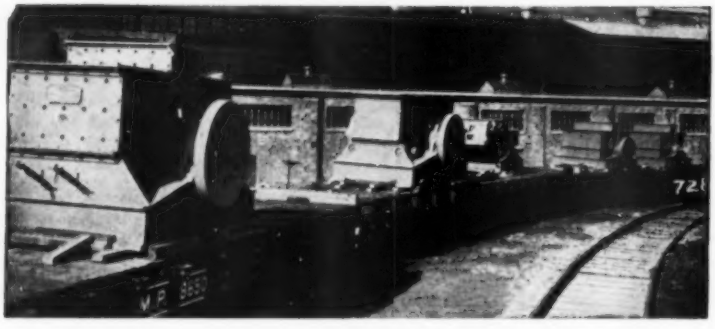
[PRIMARY - SECONDARY - FINE REDUCTION]

BULLDOG HAMMERMILLS for DRY OR WET STICKY MATERIALS FOR THOSE TOUGH HEAVY-DUTY CRUSHING JOBS 1 to 1000 ton capacity



Ask for List of Installations

ASK FOR LIST OF INSTALLATIONS



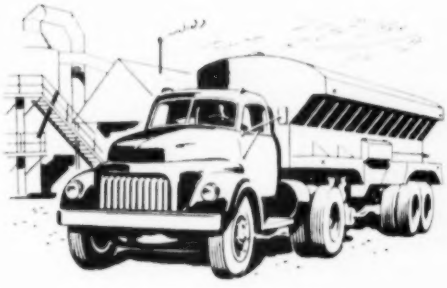
We will gladly survey your reduction requirements and recommend the proper equipment without cost or obligation. Just write or call.

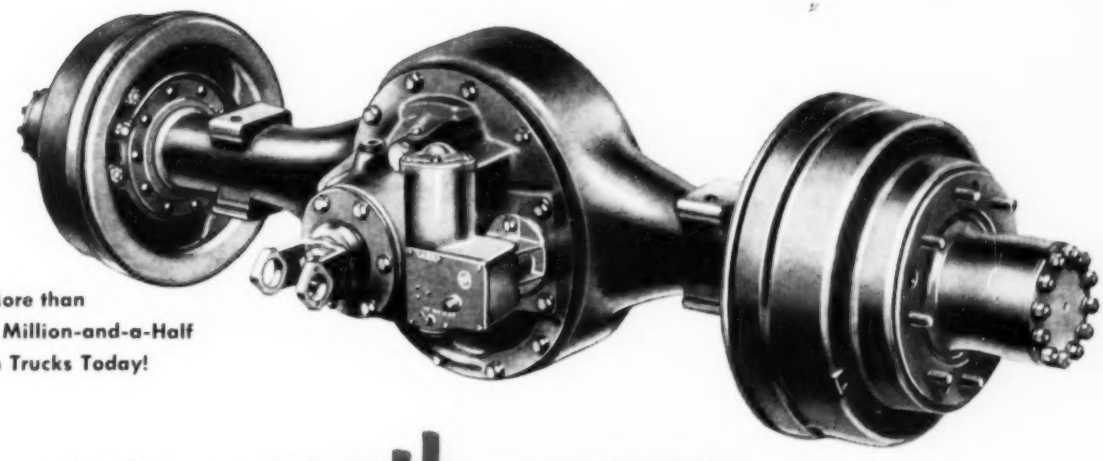
HAMMERMILLS, INC.
4766 W. Division St.

division of

PETTIBONE MULLIKEN CORP.
Chicago 51, Illinois
Phone SPaulding 2-9300

On the Job or on the Trade Eaton 2-Speed Axle Trucks





More than
a Million-and-a-Half
in Trucks Today!

are worth more

Eaton 2-Speeds double the conventional number of gear ratios. Trucks make more and quicker trips, with full payload, over all kinds of roads, in all types of service, at lower operating cost, with minimum upkeep. Engines operate within their best speed range; stress and wear are held to a minimum. Eaton 2-Speed Axle trucks last longer, earn more, and are worth more on the trade-in. Ask your dealer to explain.

EATON AXLE DIVISION
MANUFACTURING COMPANY
CLEVELAND, OHIO

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

...says CONTRACTOR FRANK ROSSI of Gardiner, Me.

"By teaming our LIMA shovel with our Austin-Western crusher, we made our own surfacing material for this new section of the Roosevelt trail . . . cutting time and costs by crushing and screening gravel on the job."

Such reports are not surprising when the teammates on the "production line" are these . . .

LIMA TYPE 604 SHOVEL—A convertible shovel (1 ½ cu. yd.), crane (30 ton) and dragline . . . very popular for road grading, quarry and gravel pit operations, and diverse construction and material handling work. Its air operated clutches and antifriction bearings guarantee smooth, quick operation. Streamlined, counter-balanced design assures you greatest capacity per pound of weight.

AUSTIN-WESTERN "201"—Portable Crushing and Screening Plant with high production and low operating cost. The "201" excels in production because of its high operating speeds and exclusive design features, oversize conveyors and extra-large screening capacity.

THERE'S A LIMA-A.W. TEAM FOR EVERY JOB! There are ***LIMA shovels*** ranging in capacity from ¾ to 6 yards, convertible to cranes with capacities up to 110 tons.

There are ***Austin-Western*** crushing plants for any requirement . . . small portable units with single crusher and screen, multiple portable units, or stationary crushing and washing plants . . . each giving you maximum production at minimum cost.

Note: Austin-Western Crushers are now being manufactured in Lima, Ohio, enabling us to maintain steady, top-quality production of crushers.

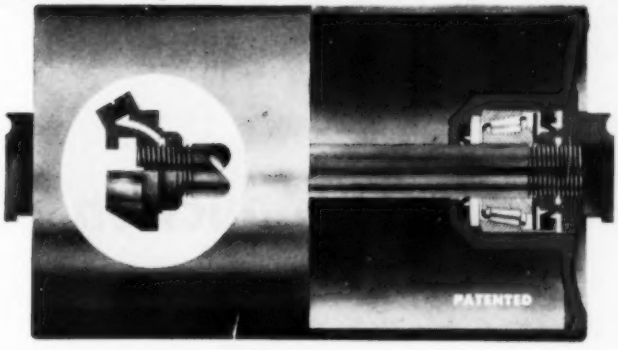
LIMA
SHOVELS • CRANES
DRAGLINES • PULLSHOVELS

BALDWIN BLH LIMA-HAMILTON
Construction Equipment Division

BALDWIN-LIMA-HAMILTON CORPORATION
Construction Equipment Division
LIMA, OHIO, U.S.A.

You Need... CONTINENTAL'S NEW UST Idlers

CGC UNIT-SEALED CGC PRE-LUBRICATED CGC TIMKEN BEARINGS



Saves Grease!
Saves Labor!
Saves Belts!
Long Life- THE ULTIMATE IN MINIMUM MAINTENANCE

Continental's Unit-Sealed "UST" Conveyor Idlers, incorporating Timken Bearings, Garlock Klozures, are the answer to the operator's prayer.

The Unit Bearing Assemblies—"sealed unto themselves" provide an ample but not excessive grease reservoir. This represents a saving of grease and further eliminates any possible migration of the grease from upper to lower bearings on inclined rolls. The lubricant is a top quality water repellant grease of a stable consistency with a wide temperature range for long life.

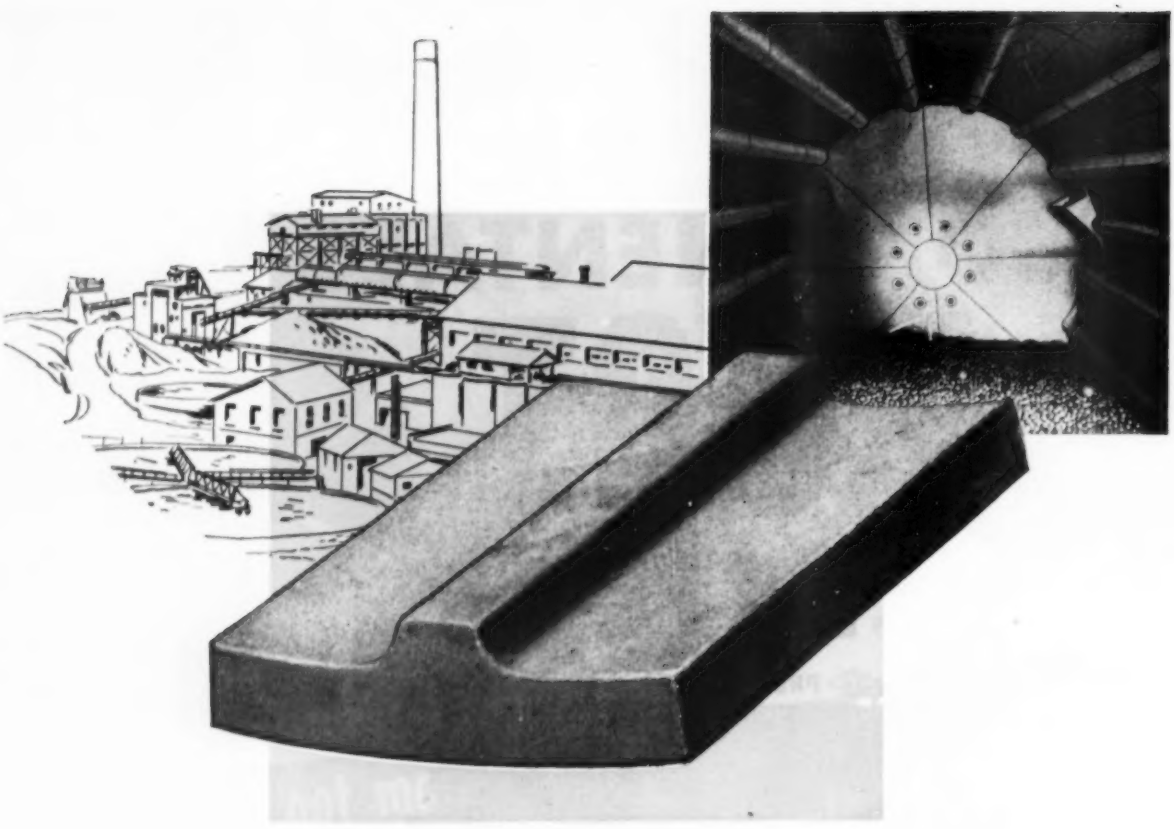
Most important—this construction permits operating the Continental "UST" Idler for extended periods of time without relubrication for 1-2-3 years or longer depending upon the severity or character of conditions.

For detailed information on these idlers write for Bulletin P.O.-116

CG-5210

INDUSTRIAL DIVISION
CONTINENTAL GIN COMPANY
BIRMINGHAM, ALABAMA

ENGINEERS CGC ATLANTA • DALLAS • MEMPHIS • NEW YORK CGC MANUFACTURERS



this LINER boosted production 35%

AMSCO Ball Mill Liners

Reduced Down-Time, Increased Production...

A large West Coast cement producer found that Ball Mill Liners were causing expensive trouble. Liners were thick—*over 3 inches.* This meant reduction in mill capacity. Thick liners also meant tremendous weight. Both thickness and weight reduced production and efficiency. *Liners wore rapidly,* too, causing frequent, expensive replacement jobs, with costly labor and material. And added to the bill was lost production due to mill down-time.

Well-known for their skill in handling impact and abrasion-resistant alloys, AMSCO engineers and foundrymen were consulted.

AMSCO solved the Ball Mill Liner problem.

AMSCO designed a new, light, thin—*1 inch thick*—liner, which because of lightness and thinness increased mill capacity, heightened efficiency. The new liners lasted beyond all expectations and in addition the segments were easier to install. These factors, plus reduced replacement down-time, have been responsible for a *35% increase in production.*

AMSCO is the largest producer of Manganese Steel, "the toughest steel known," which has proven itself under countless abrasion and impact situations. And where the service conditions require it, AMSCO also produces Chromium-Molybdenum and Chrome-Manganese alloys.

If you have a tough wear problem and suspect that there may be a better alloy for your purpose, you are invited to write to AMSCO for further information.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION

396 EAST 14th STREET · CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que. Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.

for

STRENGTH

EASY HANDLING AND FILLING

SHARP, CLEAR BRAND PRINTING

CHASE Multiwall Bags

especially designed
for the packaging, shipping
and storage of Rock Products

SINCE 1847

CHASE BAG COMPANY

GENERAL SALES OFFICES 309 W. JACKSON BOULEVARD
CHICAGO 6, ILLINOIS
30 BRANCHES AND SALES OFFICES STRATEGICALLY LOCATED

"Toughest operating but the first batch of

THIS IS A TYPICAL DRILL. It uses a 4-conductor No. 8 Amerclad cable.

Says Chief Electrician, Hudson Plant,
Universal Atlas Cement Company

● Year after year, at this quarry, the Amerclad is exposed to knife-sharp fragments of flying rock. During the summer, the rock often gets so hot that you can't even touch it. Other times, the cable lies out in the rain and snow— often at sub-zero temperatures.

At the Hudson, N. Y. quarry of Universal Atlas, Chief Electrician Frank Rodmond said, "This Amerclad runs the constant danger of being hit with flying rock fragments through secondary blasting. Yet the down-time cost of this operation is so high that we just can't stand cables that keep failing. We kept that last batch of Amerclad 12 years before we replaced it, yet it was still serviceable when we switched over to new Amerclad."

If you want service like this, specify Amerclad the next time you need cable that can really take it. Amerclad is available in a great many sizes and constructions, with or without shielding. There is a type to power anything from a river dredge or mine locomotive down to a rough and tumble electric hand drill. *Send the coupon,* and get more information.

AMERICAN STEEL & WIRE DIVISION
UNITED STATES STEEL CORPORATION
GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

A STANDARD Cable for

- **paper & varnished cambric cable**
- **asbestos wire and cable**
- **aerial, underground & submarine cable**
- **shovel & dredge cable**

U·S·S AMERICAN ELECTRICAL

condition in our quarry— Amerclad lasted 12 years"

NOTICE THE CABLE TRAY fastened to the shovel. This was developed by Universal Atlas for easier cable handling—it also prolongs life of the cable.

HERE A CABLE is raised on horses to clear the railroad track. It feeds the shovel visible in background.

TWO WORKMEN WATCH from blast shelter as charge is set off in distance. Low horses cushion cable from shock of falling rock in secondary blast areas.

every **SPECIAL** *Job!*

- mold cured portable cord
- machine tool & building wire
- special purpose wire & cable

WIRE & CABLE

SEND THE COUPON

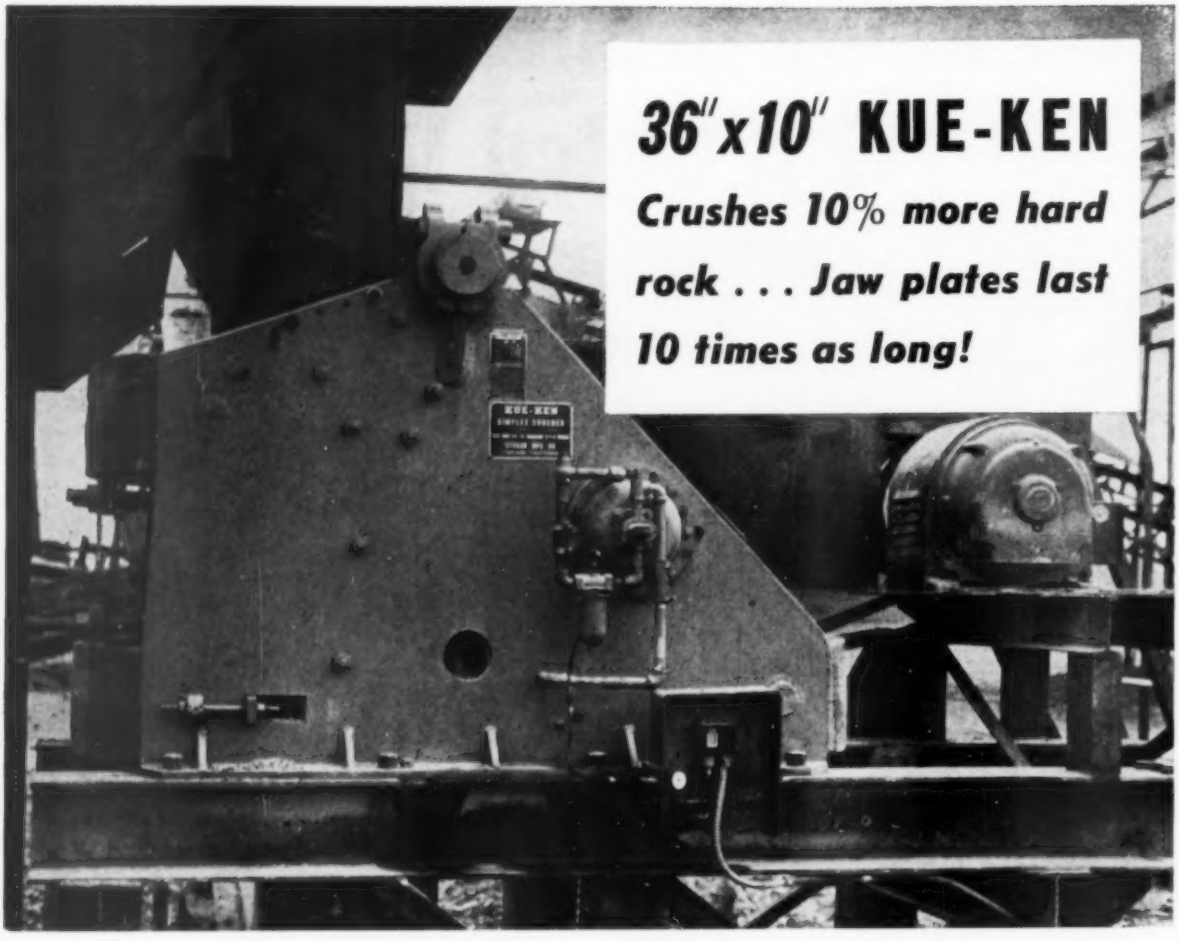
American Steel & Wire Division
Room H-73, Rockefeller Building
Cleveland 13, Ohio

☐ Please give me more information about Amerclad.
☐ I'd like to talk to your representative.

Name .....
Firm .....
Address .....
City ..... State .....

USS

UNITED STATES STEEL



A California Gravel Company* was using a 10″ x 40″ overhead eccentric type crusher. Records show that this crusher required new jaw plates every 30 days. Daily adjustments were necessary to maintain a desired product size because of the rapid wear on the jaw plates.

The Company then purchased a 10″ x 36″ KUE-KEN Crusher. The original set of jaw plates lasted 13 months, or more than 12 TIMES longer than those in the previous crusher. Furthermore, the KUE-KEN's crushing rate is 10% more per inch of jaw width, the crusher runs cool with no lubrication difficulties, and 15% less power per ton is required.

This field report is typical of the many received each month by our Engineering Department. We are justly proud of the job KUE-KEN Crushers are doing all over the world. If you are interested in high-capacity, trouble-free crushing, it will pay you to investigate KUE-KEN today.

*Name furnished on request.

See your dealer or write for factual illustrated data.

KUE-KEN pronounced "QUE-KEN"
U. S. and foreign patents pending

DEALERS: LUND MACHINERY CO., Salt Lake City, Utah; CLOSNER EQUIPMENT CO., San Antonio, Texas; WASHINGTON MACHINERY & STORAGE CO., Seattle, Wash.; CONSTRUCTION EQUIPMENT CO., Spokane, Wash.; CAL-ORE MACHINERY CO., Medford, Ore.; MILLER MACHINERY CO., Missoula, Mont.; ANAHUAC MACHINERY CO., Mexico City, Mexico; UNIVERSAL EQUIPMENT CO., Vancouver, B. C.

642 CHESTNUT STREET • OAKLAND 20, CALIF.

STRAUB MFG. CO.

Kue-Ken Jaw Crushers	Revolving Screens	Rib Cone Ball Mills
Kue-Ken Gyracone Crushers	Classifiers	Concentrating Tables
Overhead Eccentric Crushers	Feeders	Vibrating Screens

Pennsylvania Crusher Co., Exclusive Licensed Eastern Manufacturer and Distributor. Broad and Arch Streets, Philadelphia, Penn.

Sir W. G. Armstrong Whitworth & Co. (Ironfounders) Ltd. Authorized Licensed Manufacturer and Distributor. Close Works, Gateshead-upon-Tyne, England.

This brick slashed reline time 75%!

HERE'S a report on a recent check of hot zone linings in rotary cement kilns now using Permanente Periclase-Chrome bricks:

At five plants selected at random from our customer list—with capacities ranging from 1,200,000 to 3,500,000 barrels per year—Permanente Periclase-Chrome brick linings cut down-time for relining an average of 75% compared to the linings previously used!

In each of the five plants, Permanente Periclase-Chrome brick improved service—gave an average of 10 months service compared to an average of approximately 2 months with the other type brick. In addition, fewer shut-downs resulted in substantial savings in cost of materials for relining.

Such exceptional performance was possible because Permanente Periclase-Chrome bricks are *especially designed* for hot zone linings. This special design is the result of 10 years experience working with cement kilns throughout the country. Today, it's *your* best bet for higher production.

SEND FOR BOOKLET giving installation procedures and for literature explaining all the advantages of Permanente Periclase-Chrome bricks. If an appraisal of your kiln performance would be helpful, Kaiser Chemicals will be glad to work with you. Installation service at no extra cost. Standard brick sizes available, both burned and chemically bonded. Complete facilities insure superior service. Call or write principal sales offices: *Chemical Division*, Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California, First National Tower, Akron 8, Ohio.

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NEW U-1091 natural gas power unit develops 187 net h.p. at 1400 rated r.p.m.; 200 net h.p. at 1600 max. r.p.m.; maximum torque, 820 lbs. ft. @ 800 r.p.m.

NEW U-450—102 net horsepower at 1800 rated r.p.m.; 110 @ 2200 r.p.m.; maximum torque, 324 lbs. ft. @ 1200 r.p.m.

NEW U-406—91 net horsepower at 1800 rated r.p.m.; 98 @ 2200 r.p.m.; maximum torque, 279 lbs. ft. @ 1200 r.p.m.

NEW U-372—83 net horsepower at 1800 rated r.p.m.; 91.5 @ 2200 r.p.m.; maximum torque, 263 lbs. ft. @ 1200 r.p.m.

NEW U-269—62 net horsepower at 1800 rated r.p.m.; 72 @ 2400 r.p.m.; maximum torque, 191 lbs. ft. @ 1200 r.p.m.

NEW U-240—55 net horsepower at 1800 rated r.p.m.; 64 @ 2400 r.p.m.; maximum torque, 168 lbs. ft. @ 1200 r.p.m.

NEW U-220—50.5 net horsepower at 1800 rated r.p.m; 62 @ 2400 r.p.m.; maximum torque, 151 lbs. ft. @ 1200 r.p.m.

IH Announces Seven New International Engines

Seven new six-cylinder, carbureted, valve-in-head engines have been added to the International line, which now includes 18 models—diesel, gasoline or gas—ranging from 16.5 to 200 net horsepower.

These new models are the result of more than 45 years of IH engineering and manufacturing experience building a complete line of heavy duty engines for tractors, trucks, construction and oil field equipment and individual power unit applications.

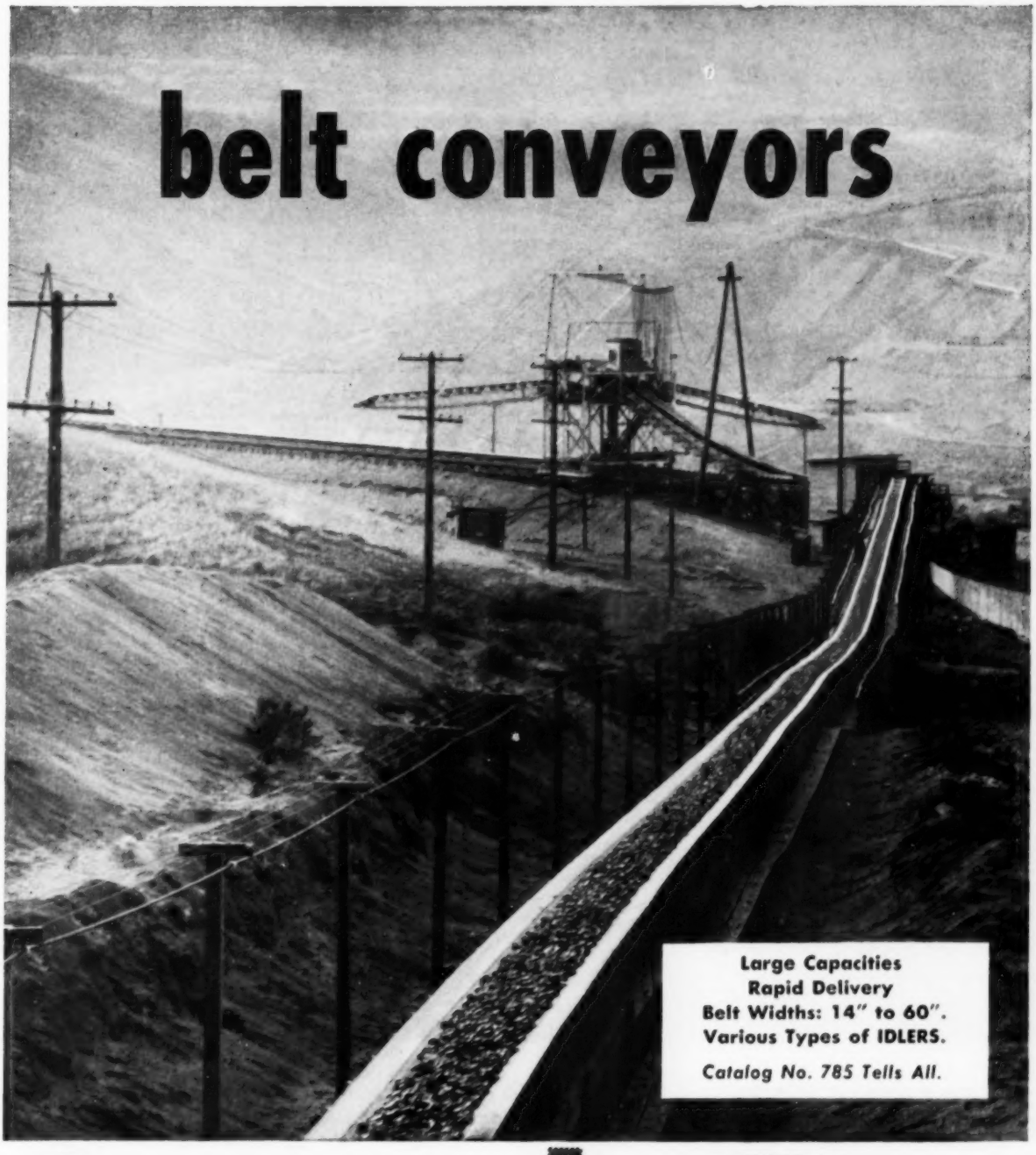
These new units have the durability, flexibility and economy to meet your requirements for lower cost performance. The unmatched network of IH district offices, parts depots, distributors and dealers puts complete service facilities practically at your door.

If you are an individual user of engines, it will pay you to see your nearest International Industrial Distributor or Power Unit Dealer for more complete information. If you are a manufacturer, your nearest IH district office will be glad to help you engineer these engines into the equipment you are building.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

POWER THAT PAYS — **INTERNATIONAL**

belt conveyors



Large Capacities
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Belt Widths: 14" to 60".
Various Types of IDLERS.

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ESTABLISHED 1877

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PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

IF IT'S MINED, PROCESSED OR MOVED
. . .IT'S A JOB FOR JEFFREY!

Wire Rope at Work—Near Hazleton, Pa., lie rich seams of anthracite coal which in places are not far below the surface of the ground. The dragline excavator shown here, owned by A. E. Dick Contracting Co., is getting at the coal by stripping off overburden—the cover of earth that is about 120 ft in thickness at this particular point.

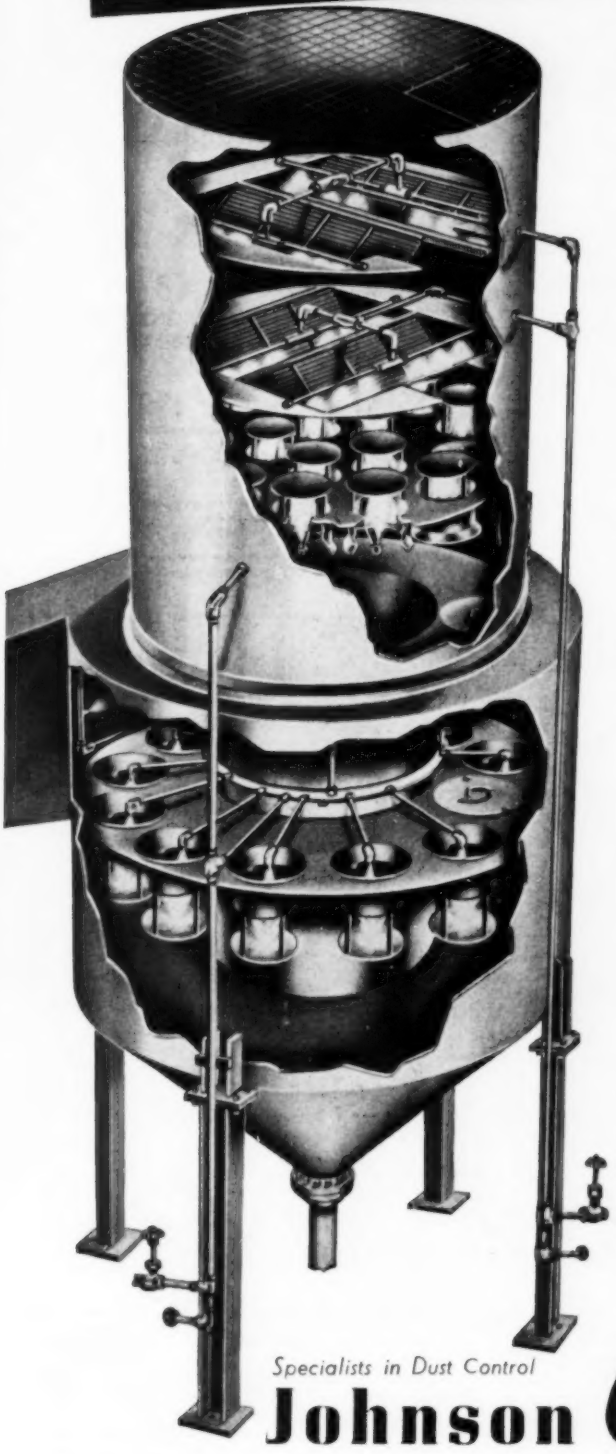
Using a 22-yd bucket, the excavator can scoop up thousands of cubic yards of dirt and rock per day. It works 'round the clock, with only minor interruptions. This mechanical mastodon is fitted throughout with Bethlehem Wire Rope, including twin draglines and hoist lines, visible in the picture as they handle the bucket. A typical assignment, the kind of rough, tough job entrusted to Bethlehem rope in every type of industry, wherever there is heavy lifting or hauling to be done.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Mill depots and distributors all over the country stock Bethlehem rope for the following industries and numerous others:

MINING • CONSTRUCTION • PETROLEUM • EXCAVATING • QUARRYING • LOGGING • MANUFACTURING

stop air pollution



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- **Extremely high efficiency dust recovery**

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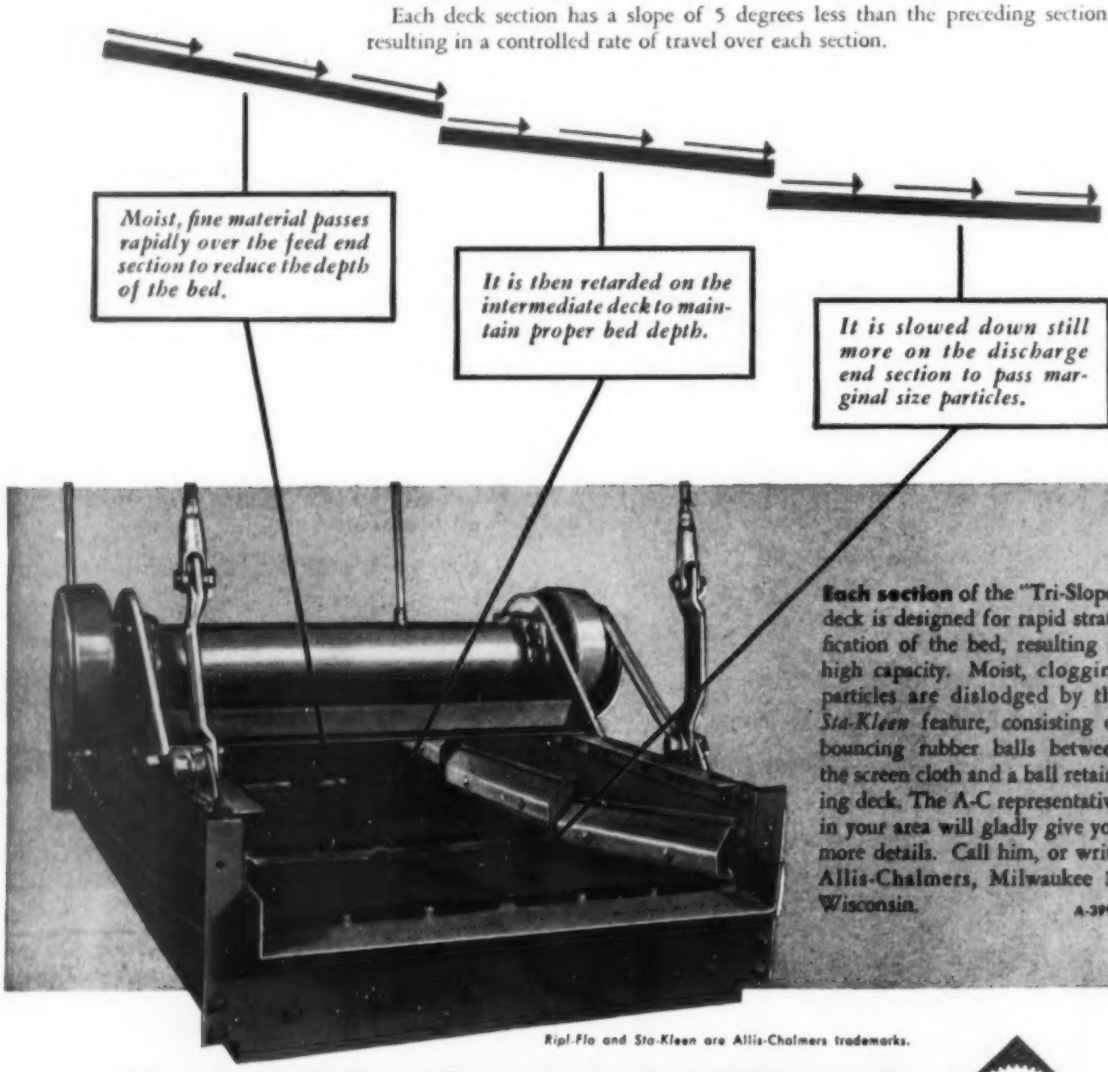
Ripl-Flo SCREEN with Tri-Slope DECK

SCREENS

Moist Fine Material

No excessive blinding and no shutdowns to clear the screen! With the "Tri-Slope" deck you can screen moist ½ x 0 to ¼ x 0 granular materials having high surface moisture. And you'll get more capacity than with a single slope deck of the same area.

Each deck section has a slope of 5 degrees less than the preceding section, resulting in a controlled rate of travel over each section.


Moist, fine material passes rapidly over the feed end section to reduce the depth of the bed.
It is then retarded on the intermediate deck to maintain proper bed depth.
It is slowed down still more on the discharge end section to pass marginal size particles.

Each section of the "Tri-Slope" deck is designed for rapid stratification of the bed, resulting in high capacity. Moist, clogging particles are dislodged by the *Sta-Kleen* feature, consisting of bouncing rubber balls between the screen cloth and a ball retaining deck. The A-C representative in your area will gladly give you more details. Call him, or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-3995

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ROTARY BLAST HOLE DRILL

The BUCYRUS ERIE 50-R

Increases Drilling Speed

. . . . . .

Reduces Drilling Costs

Meet the Bucyrus-Erie 50-R . . . the new rotary member of the world's most famous line of blast hole drills. Designed for drilling 9- to 12-in. holes in quarries and mines, it's your solution to the problem of high preparation costs. Look at this list of star-studded advantages:

1. **FLEXIBILITY** in feed and rotation speed permits drill to work at maximum efficiency in various types of material . . . prevents bit deflection.
2. **SMOOTHER, MORE UNIFORM DRILL HOLES** greatly reduce loading time, enable you to set charges where you want them. Powder requirements are reduced.
3. **SPEEDIER BANK PREPARATION.** Drill bits are of the rotating-cone oil-well type. Cuttings are cleaned from the hole by air — your bit is constantly cutting virgin rock.
4. **NO WATER PROBLEM.** The 50-R drills dry. Costly piping layouts or expensive water haulage are eliminated. You need worry no more about winter's freezing temperatures.
5. **TOP MOBILITY FOR BETWEEN-JOB MOVES.** A self-propelled unit, the 50-R is mounted on crawlers, chain driven from the main machinery. Each tread is independently controlled by an air-operated friction clutch and brake.
6. **FAST, EASY SETUPS.** The all-steel, electric-welded 54-ft. derrick is raised and lowered by an electric motor. Three hydraulic jacks, 7 inches in diameter with a 42-in. stroke and capable of a 22-in. lift, raise and level the rig before drilling.

12853C

There are many more 50-R features you should know about. For complete information write us soon.

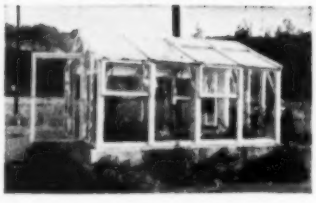
BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

Here's how ROCKMASTER® reduces noise

The noise your neighbors hear . . . and complain about . . . is air blast. It is the noise of wasted explosive energy that escapes into the air before it has done its job on the burden. Such noise is difficult to avoid when holes are spaced too closely and detonation begins at the top. This waste of power occurs because the explosives force seeks the path of least resistance.

By allowing initiation at the bottom of the holes, the ROCKMASTER Blasting System can keep the explosives force under prolonged confinement . . . as shown in the above photos taken at the height of four different ROCKMASTER blasts. Each photo shows considerable movement of burden with practically no escaping gases.

To see how the ROCKMASTER Blasting System can improve your blasting efficiency and reduce noise at the same time, send for your copy of the booklet, "Quarry Blasting the ROCKMASTER Way."



The North Jersey Quarry Company erected this greenhouse at its Millington operation, 400 feet from the working face, to prove that its blasts don't break windows. The reduced noise and vibration of the ROCKMASTER *system helps them improve community relations.*

ATLAS

ATLAS EXPLOSIVES

"Everything for Blasting"

ATLAS POWDER COMPANY, WILMINGTON 99, DELAWARE

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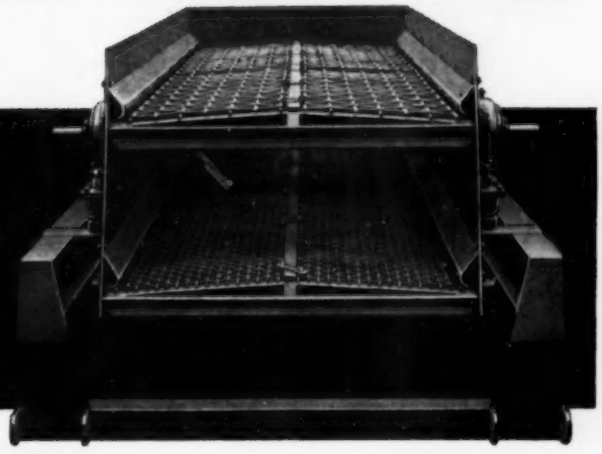
ANNOUNCING

Diamond's

5 ft. wide VIBRATING screens



10'—12'—14' LENGTHS

1—2—2½ and 3 DECKS

for ANY INSTALLATION

SPECIFICATIONS

- Timken double row bearing equipped
- Rubber mounted main bearing cages
- Adjustable spring balance cups
- Screen clamp bars over center supports
- 5/16" side plates
- 5/16" throw on shaft

SHAFT DIMENSIONS

4½" at main bearing
5¼" at pitman bearing
5¾" between pitman bearings
3 7/16" shaft at flywheel

Write for full engineering details today. For other vibrating screens from 2 x 5 to 4 x 14, ask for "DIAMOND SCREENS AND WASHERS" bulletin.

FEATURING DIAMOND'S NEW SIDE PLATE CONSTRUCTION!

FIELD TESTED for the past two years, Diamond's new series of 5' wide vibrating screens give you high production, low operating and maintenance costs, and freedom from work stoppage. Diamond's new method of reinforcing the side plates at the shaft eliminates vibration. Heavy steel plates between the bearings double the side plate strength.

Positive vibrating action plus plenty of headroom between decks give faster separation of material over entire screening area. Aggregate moves quickly from top to bottom of screen, using gravity through Diamond's inclined screen construction, to maintain a high rate of production without clogging.

EASILY EQUIPPED FOR WASHING AGGREGATE

Vibrators may be easily equipped with spray bars for washing sand and gravel during the screening operation. Screens can be driven with "V" or flat belt drive.

Everything. . . for the aggregate producer

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DIAMOND IRON WORKS, INC.
AND THE MAHR MANUFACTURING CO. DIV.
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strategically located to give unexcelled service.

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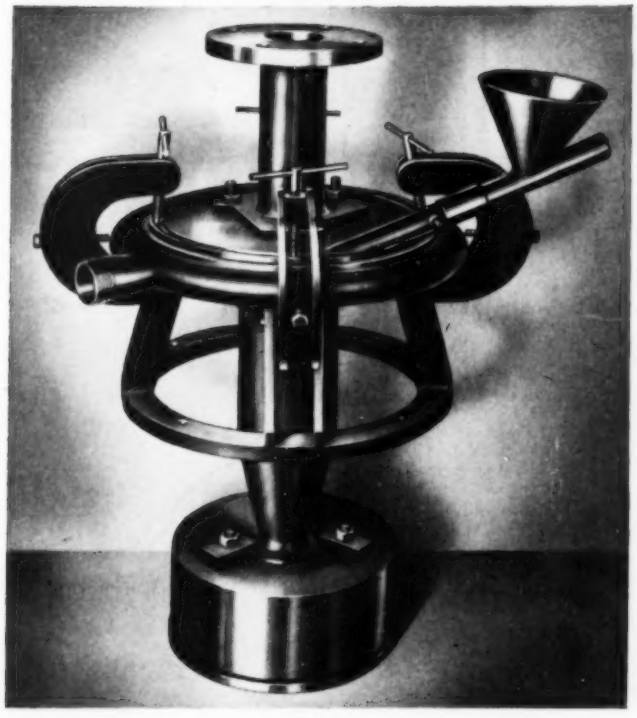


MICRONIZER*

Pulverizing Machine for Reducing Materials to Micron Sizes

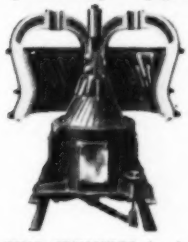
A fluid jet pulverizing machine, the Sturtevant *Micronizer* speeds reduction of materials to low micron sizes. These jet mills are especially applicable in fields where a particle size in microns is desired.

Sturtevant *Micronizer* mills are used throughout industry for reducing non-metallic and metallic minerals and ores, pigments, insecticides, fungicides, pharmaceuticals, plastics, dyes, and numerous other organic and inorganic products.

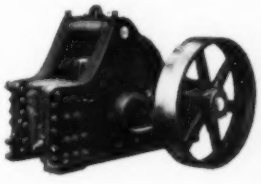
Sturtevant *Micronizer* pulverizers are available in many sizes and capacities. Write for information.

Other Sturtevant Pulverizing Equipment for Rapid Reduction of Materials...

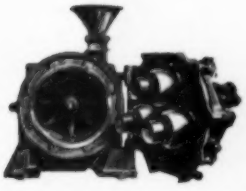
Especially Applicable for Initial Grinding of Products for the Micronizer Mill



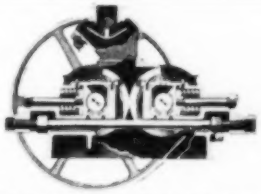
ROTARY FINE CRUSHERS for intermediate and fine reduction (down to ¼"). Open door accessibility. Soft or moderately hard materials. Efficient granulators. Excellent preliminary Crushers preceding Pulverizers.



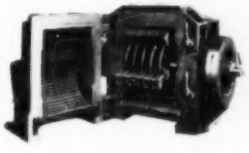
JAW CRUSHERS for coarse, intermediate and fine reduction of hard or soft substances. Heavy or light duty. Cam and Roller action. Special crushers for Ferro-alloys. Several types, many sizes.



RING-ROLL MILLS for medium and fine reduction (10 to 200 mesh), hard or soft materials. Very durable, small power. Operated in closed circuit with Screen or Air Separator. Open door accessibility. Many sizes. No scrapers, plows, pushers, or shields.



CRUSHING ROLLS for granulation, coarse or fine, hard or soft materials. Automatic adjustments. Crushing shocks balanced. For dry or wet reduction. Sizes 8 x 5 to 38 x 20. The standard for abrasives.



SWING-SLEDGE MILLS for coarse and medium reduction (down to 20 mesh). Open door accessibility. Soft, moderately hard, tough or fibrous substances. Built in several types and many sizes.

AIR SEPARATOR for separation of fines to 325 mesh and finer. Increases output from 25% to 300%... lowers power costs by 50%. Capacities ¼ to 50 tons per hour output.

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VOL. 46 JULY 1953 No. 1

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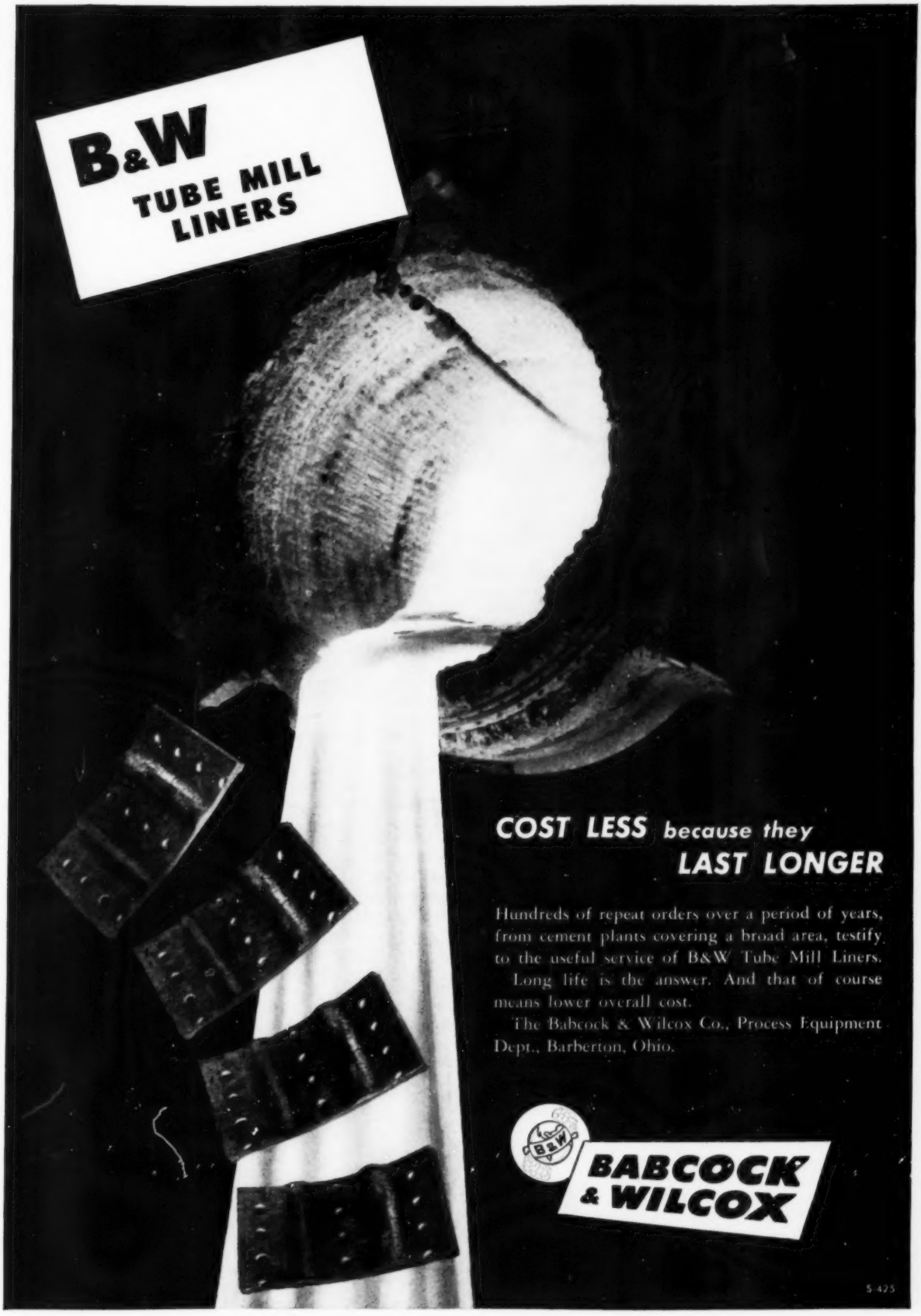
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COST LESS because they
LAST LONGER
Hundreds of repeat orders over a period of years, from cement plants covering a broad area, testify to the useful service of B&W Tube Mill Liners.
Long life is the answer. And that of course means lower overall cost.
The Babcock & Wilcox Co., Process Equipment Dept., Barberton, Ohio.
BABCOCK & WILCOX
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editorial

Importance of State Geological Surveys To Nonmetallic Minerals Producers

A FEATURE of this issue of PIT AND QUARRY is a staff-written article describing the activities of the Indiana Geological Survey, with special emphasis on the importance of those activities to nonmetallic minerals producers. This is the first of a series of such articles to be published from time to time describing the work being done in various states which recognize the importance of such activities sufficiently to provide the necessary funds for an adequate program. All of the states to be covered are doing an outstanding job, especially with respect to nonmetallic minerals.

The work being done by these various state geological surveys is basically the same, but there are variations necessitated by the different minerals to be found in them, the terrain, the availability of markets for these minerals, etc. In some states the mineral wealth consists largely of aggregates which can be marketed only in a limited area, while in others it consists chiefly of metals or the rarer nonmetals which are shipped over a wide area or even into foreign countries. In all cases, however, a new development contributes to the prosperity of the state in which it is located.

As this first article points out, the state geological surveys have come to play an invaluable role in the discovery and development of this country's vast mineral resources. They are becoming increasingly important with the steady depletion of our mineral wealth and the intensifying search for new deposits. The greatness of this country has been largely due to our vast natural resources, but we have been profligate in spending them. We have never been self-sufficient as far as minerals are concerned, and in recent years many have been added to the long list of those which we must import for most or all of our needs. The location, evaluation, and full utilization of our mineral deposits is necessary for our future greatness and security.

ACCORDING to the latest available reports, most of the states which have active mineral deposits of considerable commercial value also have adequate geological survey departments. This is particularly true of states in which the nonmetallic minerals predominate, especially the aggregates. However, in several states where the most economically available deposits of aggregates are rapidly becoming depleted, state activities along these lines are much too limited. It is notable also that several states which are among our largest producers of metals, and more recently of uranium-bearing ores, provide little support for such state activities; in one of the most important of all no funds have been provided since 1950. In some of these states, of course, the U. S. Geological Survey is doing considerable work in its nation-wide search for strategic minerals. The only state which has no geological department, and which has never had one, is one of our largest industrial states. It is also one of the most seriously beset by the problem of dwindling aggregate sources.

In Indiana the mineral wealth is confined to a limited number of items of which limestone (including dimension stone), sand and gravel, coal, and oil are the most important. Clay, shale, and industrial sand are also found in important quantities. There are no metals of any importance, although gold has been recovered in small quantities from glacial gravels.

THE Indiana Survey, as this article points out in detail, has benefitted the nonmetallic minerals industries of that state in countless ways. It has provided basic information on the location, extent, quality, and availability of all minerals found in that state. It has also given assistance in the location of new quarry or pit sites, the extension of old pits, and the rezoning of quarries; has provided geological control of state highway department quarry samples; and has helped locate new sources of high-quality limestone, high-purity silica sand, shale suitable for lightweight aggregate, and other types of deposits. In addition, the survey has gathered a wealth of data (geologic, chemical analyses, and lithologic analyses) on the state's limestone quarries, sand and gravel operations, clay pits, and other mining operations and deposits. This data is available to all and is of great potential value to producers.

THE WRITER points out that the Survey also undertakes the study of basic geological research problems which advance the field of geology. It is emphasized that the Survey does not operate a commercial testing laboratory or consulting service; when a sufficient answer to a problem can be furnished by a consulting geologist, a drilling company, or a commercial laboratory, the Survey recommends that the producer consult with the appropriate firm or individual.

Our primary purpose in presenting this article on the functions of the Indiana Geological Survey and the future articles on similar activities in other states is to help spread the realization that few if any of the activities of our state governments are as important to their citizens or to the future of our nation. This survey and the others have made, and will continue to make, outstanding contributions in mineral resources development and utilization, nearly all of which are of direct or indirect interest to the nonmetallic minerals producer. If, as a result of this series of articles, we help to create added interest in the work of these groups, especially in those states where this work is now being permitted to lag, we will feel well repaid for our efforts.

Walter E. Trasser

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DIESEL ENGINES AND ELECTRIC SETS

news of the industry

PIT AND QUARRY

Congress Acts to Reduce A.C.P. Appropriation To $195,000,000 for 1953-54

Final legislative action on the federal government's Agricultural Appropriation Bill was completed June 15, and the results are not too encouraging for the agricultural limestone producers. During that June 15th session, the Senate passed a $1,200,000,000 agricultural appropriations bill for the fiscal year starting July 1. Of that amount, $195,000,000 is to be allocated for the Agricultural Conservation Program, under which farmers are provided incentive payments for using agricultural liming material. Since this represents a decrease of nearly 25 per cent from last year's appropriation of $250,000,000, agricultural limestone production is expected to drop considerably during this coming fiscal year. This will undoubtedly represent a serious set-back in the nation's soil building and conservation programs.

In spite of this decrease in 1954 funds, however, the A.C.P. appropriation was considerably higher than the $140,000,000 recommended by Ezra Taft Benson, Secretary of Agriculture, earlier in the year. During debate on this bill, numerous congressmen voiced bitter disapproval at Mr. Benson's attempt to institute drastic changes in the types of conservation practices advocated by the A.C.P. program.

To summarize Congressional action on this bill, first about the middle of May the House approved the $195,000,000 appropriation. Then during the final Senate action on June 15, Senator Richard Russell's amendment to raise the A.C.P. to $225,000,000 won over Senator Mennen Williams' amendment to reduce it to $140,000,000 by a vote of 38 to 37. Following this action, the Senate considered the substitution of $225,000,000 for the $195,000,000 approved earlier by the House. The vote on this issue was 38-38, the tie resulting in defeat of this amendment. Senator Williams' later attempt to reduce the amount to $140,000,000 also failed by a vote of 21 to 51.

3M Plans $15,000,000 Program Of Expansion and Research

Spokesmen for the Minnesota Mining and Manufacturing Company, St. Paul, Minn., have stated that the firm will spend $10,000,000 for capital improvements during 1953 and $5,000,000 for research. One scheduled improvement is the doubling of capacity at 3M's fluorochemical plant at Hastings, Minn.

It was estimated that Minnesota Mining has spent $33,500,000 for research during the last 26 years and that sales of products stemming from that research have totaled $950,000,000.

Construction of two quonset-type buildings is under way at the New England Lime Company's plant at North Adams, Mass., for the manufacture of acoustical ceiling and wall tile. Operation is scheduled to begin this fall.

Coming Events

September 8-12, 1953—Cape Breton Island, Nova Scotia. Joint meeting, Canadian Institute of Mining and Metallurgy and American Institute of Mining and Metallurgical Engineers. Keltic Lodge.

September 21-24, 1953 — Seattle. Metal and Nonmetallic Mineral Mining Convention, American Mining Congress.

September 28-30, 1953—Colorado Springs. Directors' meeting, National Sand and Gravel Association. The Broadmoor.

October 12-14, 1953—Birmingham. Annual operating meeting. National Lime Association. Tutwiler Hotel.

October 19-23, 1953 — Chicago. 41st National Safety Congress and Exposition. Conrad Hilton, Congress, Morrison, and Hamilton hotels.

October 21-23, 1953 — White Sulphur Springs. Annual fall meeting, National Industrial Sand Association. The Greenbrier.

Supreme Court of Ohio Ends Battle for Bids By Unanimous Decision

An important decision affecting the construction of the Ohio Turnpike, a proposed 241-mile toll road across northern Ohio, was made on June 3, 1953, when the Ohio Supreme Court by unanimous vote reversed the decision of Ohio's Second District Court of Appeals requiring the Ohio Turnpike Commission to take bids on *both* concrete and asphalt paving in the building of the toll road. This new ruling will eliminate the costly and time-consuming procedure of duplicating the planning, design, and specifications for two or more types of materials in order to receive bids on each—which was necessitated by the earlier ruling.

The decision has made it possible for the Turnpike Commission to let contracts and start actual construction, which had been delayed since April.

The toll road, a $326,000,000 privately financed multilane super highway, will connect with the Pennsylvania Turnpike on the east, and the Indiana Turnpike (now under consideration) on the west. It will be made with portland cement.

Slag Lightweight Aggregate To Be Made at Duluth, Minn.

The Gary Slag Corporation, Chicago, Ill., has recently signed a contract with the American Steel & Wire Company, division of the United States Steel Corporation, to produce an expanded slag lightweight aggregate at the Duluth Works of the American Steel & Wire Company. Gary Slag also operates a large slag processing plant on the property of U. S. Steel at Gary, Ind.

The new lightweight aggregate, to be made by the Kinney-Osborne process, will be in production during the summer. Annual production is expected to approximate 100,000 cu. yd.

R. Newton McDowell, president, and Mrs. Donna Mills, vice-president, head the Gary Slag Corporation. W. J. Flynn, who previously worked with P. J. Mack, general superintendent of the Gary Slag Corporation at Gary, Ind., will be superintendent at the Duluth operation. R. J. Graham, sales engineer, will handle all sales of lightweight aggregate.

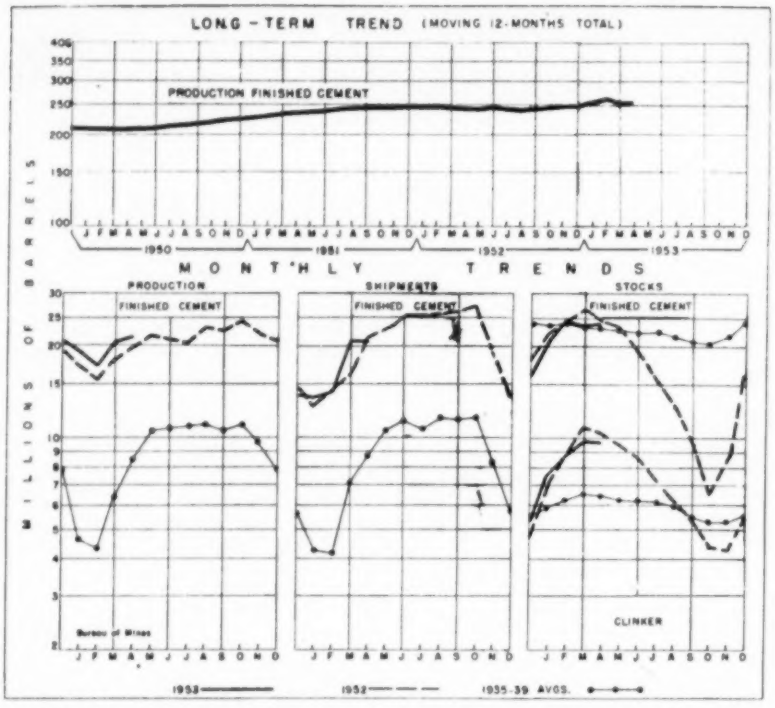
New Administrative Policy Allows Tax Deductions For Property Depreciation

T. Coleman Andrews, commissioner of internal revenue, announced on June 4 the establishment of a new administrative policy with respect to depreciation adjustments for tax purposes in order to reduce controversies between taxpayers and the Bureau of Internal Revenue on this subject. The statement of policy is as follows:

"The Internal Revenue laws allow as a deduction in computing net income a reasonable allowance for depreciation of property used in trade or business or of property held for the production of income. The purpose of the deduction is to permit taxpayers to recover through annual deductions the cost (or other basis permitted by law) of the property over the useful life of the property. The determination of the amount of the deduction is largely a matter about which there may be reasonable differences of informed judgment, but the impact on the revenues resulting from these differences may be negligible one way or the other over the years involved.

"Accordingly, effective May 12, 1953, and as respects all open years for which agreement as to the tax liability has not been reached at any level within the Internal Revenue Service as of that date, it shall be the policy of the Service generally not to disturb depreciation deductions, and revenue employees shall propose adjustments in the depreciation deduction only where there is a clear and convincing basis for a change. This policy shall be applied to give effect to its principal purpose of reducing controversies with respect to depreciation."

Mr. Andrews also emphasized that the above statement of policy related to the administration by the Bureau of Internal Revenue of the provisions of the Internal Revenue Code under existing law with respect to the allowance of depreciation deductions. It is one phase of the broader study of tax policy with respect to depreciation which is currently under study by the staff of the Under Secretary of the Treasury, Marion B. Folsom.



SUMMARY — Production of finished portland cement in April, 1953, totaled 21,802,000 bbl., as reported to the Bureau of Mines — an increase of 10 percent over the April, 1952, figure. Mill shipments totaled 20,891,000 bbl. — 4 percent less than in April, 1952 — while stocks of 24,776,000 bbl. at the end of the month were a fraction of 1 percent higher than on the same date a year ago. Clinker production during the month totaled 21,709,000 bbl. — 11 percent more than in April, 1952.

PRODUCTION — One hundred and fifty-five (155) plants located in 37 States and Puerto Rico reported a production of 21,802,000 bbl. of finished portland cement during the month, compared to 153 plants which manufactured 19,817,000 bbl. in April, 1952. Clinker production during the month totaled 21,709,000 bbl. as compared to 19,596,000 bbl. in the previous April.

SHIPMENTS — Mill shipments of finished portland cement were 4 percent lower than in April, 1952, and totaled 20,891,000 bbl. Shipments were lower in 11 districts and higher in 9 districts, as compared to April, 1952. Largest increases were registered by the Northern California, Virginia-Georgia-Florida-Louisiana-South Carolina-Mississippi, and Puerto Rico districts, while the Iowa, Oregon-Washington, Alabama, Eastern Pennsylvania-Maryland, and New York-Maine districts showed declines of from 14 to 32 percent each. Cumulative 1953 totals show shipments higher in 16 districts and lower in 4 districts than in the January-April 1952 period.

STOCKS — Mill stocks of 24,776,000 bbl. of finished portland cement were on hand on April 30, 1953 — 0.4 percent more than at the end of April, 1952 — while stocks of clinker amounted to 9,556,000 bbl. — 9 percent less than on April 30, 1952.

Marquette to Spend 3 Million For Improvements This Year

Directors of the Marquette Cement Manufacturing Company have approved new capital expenditures totaling more than $550,000 for improvements and additions to present facilities. With the proposed installations, the cost of capital improvements and replacements this year will be brought to a total of more than $3,000,000.

Major items in these appropriations is earmarked for the purchase of an additional kiln and related equipment, to be installed at the Cape Girardeau, Mo., plant within a few months. According to company spokesmen, this installation will increase the annual output of the plant by about 300,000 bbl., in addition to the 100,000-bbl. boost effected there earlier this year. These two increases will bring the cement clinker producing capacity of the Cape Girardeau plant to a total of 1,850,000 bbl. annually. The new kiln is expected to be in production by September 15.

Cement Companies Report Rising Sales and Earnings

Two Eastern cement firms and one on the Pacific Coast reported rising profits in 1952. Spokesmen of the Lehigh Portland Cement Company, Allentown, Pa., stated that sales last year rose to $53,616,855 from $50,766,570 in 1951. Net income (1952) was $3.07 per share, against $2.90 in 1951.

Dragon Cement Company, Inc., New York, N. Y., reported net sales of $9,325,771, for the year ended March 31, 1953, as compared with $9,319,830 for the previous 12-mouth period. Net income climbed from $821,289 last year to $971,975 this year, and earnings per share went from $4.82 to $5.71.

Gordon Tongue, president of the Northwestern Portland Cement Company, Seattle, Wash., told stockholders that the plant is in top operating condition. Net profit was reported to be $200,167 for the year ended December 31, 1952, or $4.44 per common share; in the previous year the figures were $194,440 and $4.20.

The Glacier Sand & Gravel Company, a wholly-owned Permanente Cement Company subsidiary, is currently building a new and larger sand-and-gravel plant of 1,000,000 tons' annual capacity at Steilacoom, Wash., to serve the entire Puget Sound area, it was recently announced.

Pennsylvania Mineralogists Hold Field Trip-Meeting At Blue Ball, Pa., Quarry

On May 3, 1953, about 140 members and friends of the Mineralogical Society of Pennsylvania attended the combined field-trip and meeting at the John C. Showalter quarry at Blue Ball, Lancaster County, Pa. The industrious efforts of the members produced some fine specimens of crystallized calcite, pyrite, chalchopyrite, quartz, fluorite, and beautiful groups of pink dolomite crystals.

After the business meeting the host, John C. Showalter, aided by his son, John Clemens Showalter Jr., and his nephew W. S. Stauffer, opened the refrigeration units of a large truck from their White

Two enthusiasts gathering mineralogical specimens.

Oak Dairy farm and served ice cream, white and chocolate milk, orange juice, pretzels, and cookies.

Lavish hospitality was experienced by the group when Mr. Showalter was host at the 1952 annual meeting, but at that time it seemed too good to be real. Now the members are convinced that it actually happened; they hold it in shining

L. J. Duersmith, past president of the society; J. C. Showalter, owner of the quarry at Blue Ball; and Dr. Arthur Hopkins, president.

contrast to the fact that more and more quarries in neighboring states are being closed to collectors.

Mr. Showalter assured the group that he was fully insured against accidents to any of his quarry visitors, who are always welcome. Within the last year he has played host to several hundred collectors from Pennsylvania, New Jersey, Arizona, West Virginia, and Georgia. Members remarked that collectors seldom have received such courtesy and consideration.

The Mineralogical Society of Pennsylvania, numbering 240 members, makes it an active practice to help protect quarry owners' property by having its members report acts of vandalism. On individual trips the members have cautioned children and adults found tampering with machinery about the serious consequences that would be forthcoming if that practice did not cease. Members often take the license numbers of persons found doing property damage and hand them over to the proper authorities. The society feels that it is the obligation of its members to the owner or quarryman to police quarry and mine workings whenever they are privileged with permission to collect specimens from the workings.

Railroad, Alpha Officials Make Inspection Trip To New Cement Plant

The new plant of the Alpha Portland Cement Company at Jamesville, New York, six miles southeast of Syracuse, was inspected on May 15 by officials of the Delaware, Lackawanna & Western Railroad Company, which services this plant, and by the board of directors, officers, and executives of the cement company.

The Lackawanna Railroad attached to their crack streamliner train, the "Phoebe Snow," at Hoboken, N. J., their president's car and a diner-and-lounge car for the transportation of the party to the plant.

The new plant effects economies in the delivery of raw materials. A new shale quarry was opened, and the process of manufacture was changed from a dry- to a wet-process plant, so as to take advantage of the moisture content of the raw materials. The capacity was increased from 1,200 bbl. per day or 430,000 bbl. per year to 2,200 bbl. per day or 800,000 bbl. per year.

The design of the new plant permits the making of cement to meet New York State Highway special cement specifications, which could not be met by cement manufactured in the old plant. Five different types of portland cement and mortar cement may be manufactured in the new plant.

Due to the inability to obtain priorities on steel, heavy machinery and electrical equipment, there was a delay in completing the new plant, but it is now operating daily. A concrete road connects the plant with the county road system. The entire plant area is floodlighted and attractively landscaped.

The inspection group included the following: Perry M. Shoemaker, president; Clyde F. Farmer, vice-president; W. G. Dorsey, superintendent; P. W. Strong, trainmaster; H. R. O'Hara, division freight agent; L. R. Walker, agent; and L. A. Walton, general yard master—all of the D. L. & W. Railroad. In the Alpha Portland Cement group were the following: J. F. Magee, president; Robert S. Gerstell, J. D. McKelvy, and H. Hanks, vice-presidents; K. T. Wright, secretary and treasurer; N. O. Wagner, assistant vice-president; W. N. Knecht, traffic manager; J. A. Anderson, superintendent; and Charles Litsinger, chief clerk (Jamesville plant); D. L. Ziegler, eastern general superintendent; V. W. Anchaitis, engineer; and C. M. MacKain, sales representative (Syracuse); and G. S. Brown, J. J. Matthes, Morris R. Williams, Vermont Hatch, Samuel G. Baker, and John R. McCune Jr.—all directors.

Riverside Cement Company Erecting Employee Facilities

Three shifts working seven days a week posed many problems for the expanding Riverside Cement Company at its semi-desert site in Oro Grande, Calif. Because this heavy-duty work, by its nature, is dusty and grimy, and because the temperatures in the area are rigorous, ranging from ten degrees to 125 degrees, the company began making plans for a building to serve as a combination dressing room, wash and shower room.

The task was assigned to George B. Allison and Ulysses Floyd Rible, Los Angeles architects, who designed a 6500-sq. ft. windowless building which will meet all requirements.

Scheduled for completion by October, 1953, the structure will be built almost entirely of concrete products, including precast concrete structural members, concrete cast in place, stained concrete floors, concrete block, and cement roofing shingles.

Cover Picture....

● These two 10½- by 380-ft. rotary kilns are part of a new $14,000,000 cement plant recently built by Lehigh Portland Cement Company near Bunnell, Fla. The plant's 1,400,000-bbl. capacity will help relieve a critical cement shortage existing in Florida.

Note that the kilns, which are F. L. Smidth all welded steel units, are equipped with thermocouples. A 16-page article on this modern cement plants begins on page 98.

William S. Lowe, president of the A. P. Green Fire Brick Company, Mexico, Mo., was the commencement speaker at South Dakota State College at Brookings, S. D. Mr. Lowe is an alumnus of South Dakota State.

R. K. Gottshall President Of Atlas Powder Company Succeeding Isaac Fogg

Ralph K. Gottshall was elected president of Atlas Powder Company of Wilmington, Del., by the board of directors at the recent annual organization meeting. He was also elected chairman of the executive committee.

He succeeds Isaac Fogg, who becomes chairman of the board and remains chairman of the finance committee.

In pursuance of the company's retirement policy, Mr. Fogg has retired as president and chairman of the executive committee, offices which he has held since 1945. Mr. Fogg succeeds Leland Lyon as chairman of the board. Mr. Lyon, who will remain as a member of the board, has been its chairman since 1945, following his retirement from the presidency of the company.

Mr. Gottshall has served as executive vice-president of the company since May of last year. He has been a director and a member of the executive committee since 1951. Prior to that time he was assistant general manager of the explosives department, having been promoted to that position from director of explosives sales.

Having joined the Atlas Powder Company as a chemist in 1927, Mr. Gottshall worked at the company's Atlas, Mo., explosives plant from 1927 to 1928 and its Giant explosives plant in California from 1928 to 1935. In 1935 he was transferred to the San Francisco explosives sales office and in 1939 was appointed sales manager of the Seattle district. Mr. Gottshall is a director of the American Mining Congress.

Mr. Fogg has been associated with Atlas Powder Company since its organization in 1913, when he became assistant to the treasurer and secretary of the new organization. He was made assistant treasurer of the company in 1917 and in 1927 was elected treasurer. Later the same year he was elected to the board of directors and the executive committee. In 1931 he was made a vice-president, continuing to hold the office of treasurer. He was elected president and chairman of the executive committee in 1945.

Under Mr. Fogg's direction the company accelerated its diversification program, with special emphasis on industrial chemicals. Expansion programs were carried out at the Atlas Point plant, south of Wilmington, and at the Darco activated carbon plant in Marshall, Tex. More recently the company has announced the purchase of land in the Fairfax area with the intention of constructing a modern office building.

Texas Lime Co. Leases Plant Of Limestone Products Company

Operation of a lime plant at Cleburne, Tex., by the Texas Lime Company, a new organization, was announced recently by Louis R. Meyers, president. D. F. Woodbridge, vice-president of the firm, will be general manager. The new concern has leased the facilities of the Limestone Products Company at Cleburne, which built the plant and operated it from 1947 until the present. The Texas Lime Company is owned jointly by local capital and Batesville White Lime Company of Batesville, Ark.

Ralph K. Gottshall

Present capacity of the plant is 150 tons of lime per day and more than 300 tons of crushed limestone. It was stated that an effort will be made to double this tonnage by 1954. Plans are under way for the expansion of storage facilities.

March Lime Sales Show Rise Of 12 Percent Over February

In March, 1953, domestic sales of open-market lime (744,912 tons) were 12 percent higher than in the previous month, according to reports by producers of the U. S. Bureau of Mines. Increases in all the major uses were noted. The table shows sales by types and major uses.

Silver Anniversary Marked At Thomaston Plant Of Dragon Cement Co.

Twenty-five years of continuous operation at Thomaston, Maine, were marked by the Dragon Cement Company, Inc., on May 14. On that day in 1928 the first shipment of cement left the Dragon (then Lawrence) plant at Thomaston, placarded as "Solid train, Dragon Portland Cement, first shipment from New England's own and only cement mill. . . ."

The Thomaston operation was launched on a site originally owned by the New England Portland Cement Company, which had erected a lime plant there, but had never completed plans for a cement mill. The Lawrence Cement Company first began making cement in New York state, later transferring its facilities to Northampton, where in 1871 the first portland cement in America was made by David Saylor. The firm name was changed to its present form in 1951.

At Thomaston output has increased to 2,000,000 bbl. annually; capacity has expanded over the 25 years by 80 percent.

Spokane Portland Cement Co. Sales, Profit Lower in 1952

Sales and earnings of the Spokane Portland Cement Company declined during the year ended December 31, 1952, according to company spokesmen. While net sales in 1951 were $2,246,911, the figure dropped to $2,090,686 last year; net profit stood at $172,732 in 1951, but sagged to $85,615 the following year. The drop in earnings was attributed by President Walter B. Neill partly to government-imposed restrictions which prohibited any compensatory increase in selling prices to offset rising costs of labor, supplies, and freight.

Production, however, was high in 1952 —690,324 bbl. of portland cement, or 106 percent of the plant's rated capacity. Shipments of 643,896 bbl. were about 5.8 percent below the 1951 record.

Lime Sold by Producers[1] in the United States, in Specified Periods of 1952-53, by Types and Major Uses (Short Tons)

	1953			Total First Quarter	
	January	February	March	1953	1952
By types:					
Quicklime	564,854	528,200	576,565	1,669,619	1,555,795
Hydrated lime	134,942	136,807	168,347	440,096	431,403
Total lime[2]	699,796	665,007	744,912	2,109,715	1,987,198
By uses:					
Agricultural:					
Quicklime	1,688	2,981	5,518	10,187	9,610
Hydrated lime	9,503	14,714	24,735	48,952	48,974
Total	11,191	17,695	30,253	59,139	58,584
Building:					
Quicklime	14,642	14,209	17,933	46,784	47,271
Hydrated lime	63,929	63,590	80,188	207,707	206,768
Total	78,571	77,799	98,121	254,491	254,039
Chemical and other industrial:					
Quicklime	345,495	324,474	350,546	1,020,515	978,781
Hydrated lime	61,510	58,503	63,424	183,437	175,661
Total	407,005	382,977	413,970	1,203,952	1,154,442
Refractory (dead-burned dolomite)	203,029	186,536	202,568	592,133	520,133

[1]Also includes a small quantity of captive tonnage (6-7 percent of the total reported herein) to maintain comparability with the annual lime statistics.
[2]Approximately 60 per cent of lime produced is high-calcium and 40 percent high-magnesium.

TOUGH TEST for a scraper

Stripping dry, very hard clay overburden is a severe test of a scraper. When it can haul 1,000 yards in an eight-hour day with a 2,400-foot round trip, it has passed the test with flying colors. That's the record of this Caterpillar No. 80 Scraper and D8 Tractor, stripping overburden from red firebrick clay near Ione, Calif. They are owned by John Pedro of Stockton.

Mr. Pedro has standardized on Caterpillar equipment, with five D8 Tractors, three No. 80 Scrapers, a Motor Grader, Ripper and two stationary Cat* Diesel Engines. "I've owned Caterpillar equipment for about 18 years," he says. "I'm always able to get parts and service, and have had very little down time. If I were to buy more machines tomorrow, I'd make them Caterpillar-built units."

Mr. Pedro reports that his No. 80 Scraper is push-loaded full of hard clay in about 45 seconds, and unloads in about 10! The burly No. 80 hauls a heaped load of 20 yards. Being cable operated, it loads smoothly, and can pump "dead" material. And it unloads quickly and evenly with positive, fast-responding ejection.

Like all Cat equipment, the No. 80 is built to stay on the job and out of the repair shop. Good design, rugged construction and high tensile steels give it the ability to earn its keep for years to come.

Your Caterpillar Dealer will gladly demonstrate, *on the job*, the Cat Scraper that fits *your* needs. He stands back of the machine he sells with factory-supervised service and a big parts stock. Call him today.

Caterpillar Tractor Co., Peoria, Illinois.

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Dr. Hognestad Appointed To P.C.A. Development Staff as Section Manager

The Portland Cement Association has announced the appointment of Dr. Eivind Hognestad, former faculty member of the University of Illinois, to the staff of its Research and Development Division, effective May 1, 1953.

Well known in the United States, Canada, and Europe for his work in the field of reinforced concrete and structural engineering, Dr. Hognestad has been appointed manager of the structural development section. He succeeds C. C. Carlson, who has been appointed manager of a newly formed products and applications section. Both appointments were announced by Dr. A. Allan Bates, vice-president for research and development of the association.

Prior to joining the association, Dr. Hognestad was research associate professor in the department of theoretical and applied mechanics at the University of Illinois. He holds the degrees of civil engineer and doctor of technical sciences from the Norwegian Institue of Technology. He is the author of numerous articles, papers, bulletins, and research reports pertaining to reinforced concrete design and structural engineering. He is a member of several national committees of the American Society of Civil Engineers and the American Concrete Institute, and has been a principal investigator for the Reinforced Concrete Research Council.

The structural development section which he heads has been enlarged "to handle more effectively the very complex and rapidly growing field of structural concrete".

The newly-formed products and applications section, under the management of Mr. Carlson, will continue previous studies of concrete products and in addition will be charged with the pursuit and study of new products and applications for portland cement.

990,000 Man-Hours of Safety Win Award for Canadian Plant

At a dinner held at Woodstock, Ont., Canada, K. C. Towe, president of American Cyanamid Company, New York, recently presented the President's Safety Award bronze plaque—Cyanamid's highest honor for safety achievements — to Arthur Mushlian, quarry superintendent, who accepted the award on behalf of the staff of the Ingersoll Quarry Division of North American Cyanamid Limited, Niagara Falls, Ont., Canada. A billfold with "Ingersoll Quarry President's Safety Award" in gold lettering was presented to each employee as a memento of winning the award for completing 990,000 man-hours of work without a lost-time accident.

A safety record believed unique in Canadian mining and quarrying history was thus officially acknowledged by the management of this safety-conscious Canadian quarry operation.

Within plain sight of motorists driving along No. 2 highway between the cities

Dr. Eivind Hognestad

of London and Woodstock, the Ingersoll Quarry has been operated for more than 40 years in Oxford County. Fifteen railway cars carrying a total of 1,000 tons of limestone leave the quarry every day bound for Cyanamid's Niagara plant. This material, said to be among the purest found anywhere in North America, forms one of two basic raw materials in the Cyanamid manufacturing processes at Niagara Falls. In addition, 400 tons of pulverized fine stone leave the quarry every day by rail and truck, to be used as fertilizer filler, agricultural lime, stock and poultry feed, and in several manufacturing processes and in road construction.

A. O. Williams, vice-president of the firm, presented the National Safety Council Award plaque to F. A. Delaney, chairman of the safety committee, who accepted the award on behalf of the employees of the Ingersoll quarry.

N.Y. Trap Rock Corp. Plans $1,500,000 Fleet Of Thirty Deck Scows

A contract for the construction of 12 deck scows has been signed by New York Trap Rock Corporation as the first step in a $1,500,000 fleet expansion and replacement program, according to Wilson P. Foss III, president.

Mr. Foss stated that the deck scows will be built by the Sound Ship Building Corporation of College Point, Long Island. These are the first of a fleet of 30 which will be completed in 1954.

Mr. Foss said, "The new scows will augment our present fleet sufficiently to allow us to meet greatly increased demands for crushed stone required for important state highway and municipal street programs, as well as for national defense and private construction. It is a further move to our expansion plans, which include the erection of additional stone processing facilities at our Haverstraw location at an estimated cost of $1,000,000."

Each of the 1,000-ton, stone-carrying scows will be constructed of Douglas fir and will be 115 ft. long by 36 ft. wide. In line with company's policy of naming scows after long-service employees, the first of the new class will be named the *Lillian M. Byers*. Miss Byers is assistant secretary of the corporation and has been with Trap Rock for over 25 years.

Texas Industries Subsidiary To Make Haydite at Choctaw

Oklahoma Lightweight Aggregate Company officials have announced plans for the construction of a $250,000 plant at Choctaw, Okla., for the production of Haydite, a lightweight aggregate. This firm is a subsidiary of Texas Industries, Inc., of Dallas.

It is expected that the new facilities will have a capacity of 100,000 cu. yd. of Haydite per year.

Photo by Jessie Longfield, Woodstock Sentinel-Review

● North American Cyanamid Limited officials and employees at the safety award presentation dinner: Mary Johnston, office receptionist, Ingersoll; S. F. Spence, safety director, American Cyanamid, New York; Arthur Mushlian, quarry superintendent, Ingersoll; K. C. Towe, president, American Cyanamid, New York; Mayor Thomas J. Morrison, Ingersoll; F. Delaney, office manager, Ingersoll; F. S. Washburn, president, N.A.C.L., N.Y.; A. O. Williams, vice-president, Niagara Falls; T. P. Turchan, Niagara plant manager; and P. Davidson, executive assistant, Niagara Falls.

Georgia Marble Company Buys Plants and Quarries Of Two Corporations

Stockholders of The Georgia Marble Company of Tate, Ga., have approved the merger by which the company acquired the modern plants of Tennessee Marble, Inc., of Knoxville, Tenn., and the Green Mountain Marble Corporation of West Rutland, Vt. In addition to these two plants, each with extensive quarries, Georgia Marble also acquired the St. Genevieve Marble Quarries of St. Genevieve, Mo. These properties were purchased by issuance of preferred and common stock.

The acquisition of these companies, together with the comparatively recent purchase of the Alabama Limestone Company of Rockwood, Ala., is another important step in the long-range expansion plans of The George Marble Company. As a result of the merger the company is now one of the largest producers of marble and stone in the world.

The company's recently developed Calcium Products Division, which produces both finely-ground high-calcium marble and Georgia Marble chips, has found a very broad market for these materials, which are used in many manufactured products, including paints, asphalt and rubber floor tile, tires and rubber goods of all sorts, and ceramics, as well as marble roofing stone chips known as "Whitetop". Because of the rapid development of this division its plant facilities at Marble Hill, Ga., have been enlarged several times.

Magnesium Cutback Closes Plant Run by N. England Lime

The General Services Administration has ordered a cutback in magnesium production which will halt operations at the New England Lime Company's magnesium plant at Wingdale, N. Y. The order went into effect on June 30.

Another magnesium plant of New England Lime at Canaan, Conn., will probably continue in operation, according to Chauncey C. Loomis, president. Both plants are owned by the government and operated under contract. Three other plants also are affected by the magnesium cutback. They are located at Painesville, Ohio, Manteca, Calif., and Spokane, Wash.

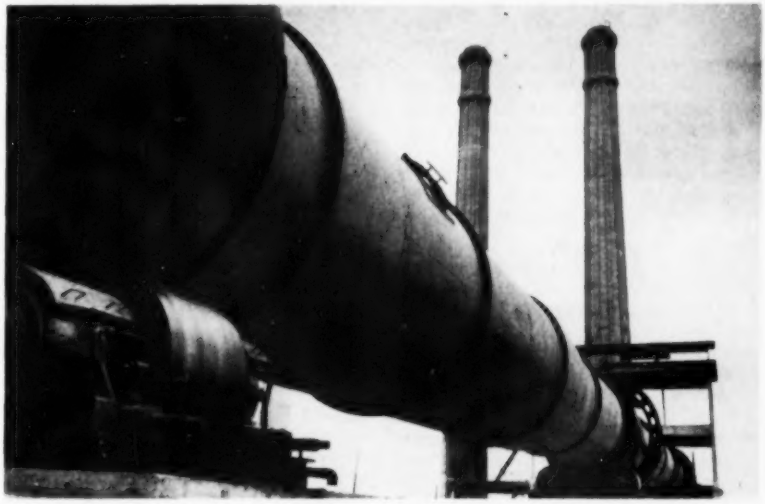
Sales Rise, Some Profits Dip In 1952 in Nonmetallics Field

Most nonmetallic minerals producing companies reported favorable results in sales for 1952, although in some cases earnings were down.

American Potash & Chemical Corporation officials stated that sales in 1952 amounted to $18,049,179, against $17,749,143 in 1951; net income last year was $1,670,555, compared with $1,960,622 in 1951.

The annual report of the United States Potash Company, Carlsbad, N. M., showed an increase in sales from $14,986,284 in 1951 to $15,026,836 in 1952; net income, however, dropped from $3,497,131 in 1951 to $3,042,195 in 1952.

● A general view of the new plant of Cementos Hontoria, S.A., at Venta de Banos, Spain, during construction. In the foreground are the storage building (left), and three cement storage silos; in the rear (right) the slurry tanks may be seen.



● Perspective of the 2.75- by 3- by 75-meter kiln (No. 1) at the Cementos Hontoria, S.A., installation. This kiln has a capacity of 225 tons per day.

The decline was said to have been due to increased costs.

Jefferson Lake Sulphur Company sales in 1952 reached a total of $6,857,584 and a net income of $1,231,560; in the preceding year the figures were $6,281,725 and $1,320,938, respectively.

Although total sales for the Johns-Manville Corporation reached $244,707,540 in 1952, against $238,034,399 in 1951, net profit dropped from $24,530,508 to $22,619,951.

Pennsalt Report Records Plant Expansion, Top Sales

Expansion of production facilities of the Pennsylvania Salt Manufacturing Co. during 1952 and the acquisition of Sharples Chemicals, Inc., early in the year gave Pennsalt a broader base than it has ever had before, George B. Beitzel, president, told share owners in the company's 102nd annual report.

During 1952, the report showed, $7,280,000 was spent on expansion. This was more than in any previous single year. The company has been granted certificates of necessity permitting accelerated amortization on more than half of these investments.

The report showed that sales in 1952 were $57,484,298, the highest in the company's history and 21 percent above sales of $47,554,688 in 1951.

Net earnings after federal and state income taxes were $3,217,942, compared to $3,542,309 in the previous year. The 1952 earnings, were equivalent to $2.59 per share on the 1,242,799 shares outstanding at the year end, as compared with net earnings of $3.30 per share on the 1,074,410 shares outstanding on December 31, 1951.

Earnings were adversely affected last year, the report stated, by the steel strike, by controlled prices while costs rose, and by reduced sales of agricultural chemicals due to the drought, and by the fact that the company charged $470,423 against profits for accelerated amortization.

● One of the scrapers used at the Northern Ohio Stone Company's quarry at Flat Rock, Ohio, to remove overburden.

Scrapers Do a Tough Job At Ohio Quarry Operation

At the Northern Ohio Stone Company's quarry at Flat Rock the Chapin and Chapin Construction Company is using two new Euclid scrapers to strip overburden in an operation involving 50,000 cu. yd. The job opened in March, with the scrapers working under wet, rugged conditions. Despite these conditions and the one-way traffic on ramps of 8 percent grade from the loading area to the quarry floor and up again to the fill, the units averaged 127 bank-yards per hour on the 1,950-ft. haul.

The material loaded was light clay and broken limestone in the last foot of overburden. Discounting delays, the scrapers made a complete cycle in an average of 3.42 minutes and loaded in 48.6 seconds.

International Harvester To Take Over Bucyrus Line Of Tractor Equipment

Under the terms of a recently completed agreement the Bucyrus-Erie Company's industrial tractor equipment will be sold, distributed, and serviced by the International Harvester Company to its industrial power distributors. Eventually this type of equipment will also be manufactured by International Harvester. Bucyrus-Erie has been for many years a manufacturer of allied equipment for International Harvester's industrial tractors.

Because Bucyrus-Erie needs additional facilities for the manufacture of its other products, its management has decided to withdraw from this line. Until January 1, 1954, however, this firm will continue to supply International Harvester distributors directly with allied tractor equipment. After that date International will take over the sale, distribution, and servicing of Bucyrus tractor equipment, purchasing its requirements from that company up to the limits of its capacity, and reselling to Harvester distributors.

Eventually, but without interrupting the continuity of production, Bucyrus-Erie will discontinue making its present line of tractor equipment, and Harvester will take over the manufacture of such units.

Jet Piercing in Primary Drilling Demonstrated at Quarry Site

A highlight of the meeting of the International Acetylene Association, held in Atlanta, Ga., April 13 to 15, was a demonstration of jet piercing as a means of putting down primary blast holes. Staged at the nearby granite quarry of Consolidated Quarries Corporation, the demonstration was watched by approximately 150 persons.

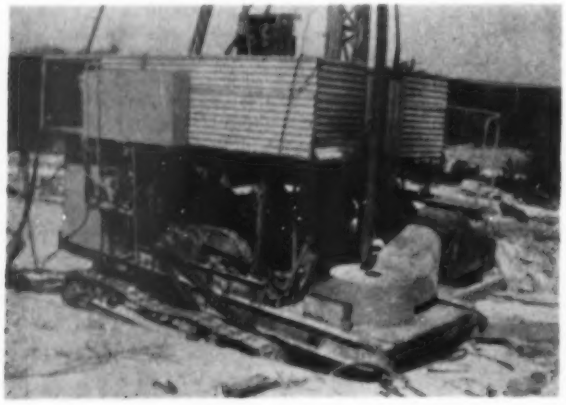
The equipment used consisted of a suspension-type 5-in. water-cooled blowpipe mounted on a modified Bucyrus-Erie 27-T well drill. Instead of the 12- to 36-in. stroke normally used for churn drilling, the spudding action of the unit was adjusted to give the blowpipe a 4-in. oscillatory stroke at about 45 cycles per minute. The oxygen-regulating equipment, fuel pump, and water pump were mounted on the drill. Fired with kerosene and oxygen, the rocket-type burner produced a flame with a temperature of approximately 3,500 deg. F. and a velocity of about 6,000 f.p.s.

During the demonstration a 6½-in. dia. blast hole was pierced a rate of approximately 40 f.p.hr. The Consolidated Quarries' deposit of biotite granite-gneiss consists largely of quartz and feldspar, and the experimental results with jet piercing show promise of effecting a material reduction in primary drilling cost. The work has been carried out under the supervision of Nelson Severinghaus, vice-president and general manager of the company, with the co-operation of development engineers of The Linde Air Products Company.

Boss of 3 New Jersey Plants Is No Mere Figurehead

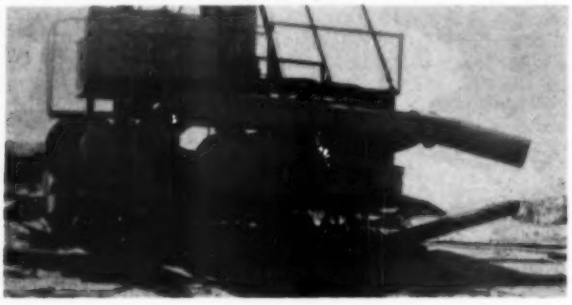
When a caller stops at the Consolidated Stone and Sand Company's plant near Little Falls, N. J., and asks to see the boss, he is usually startled to see who turns up. "He" is Mrs. Mary Mitchell, vice-president of the firm, who is reportedly the first woman quarry operator in New Jersey. This capable and attractive boss-lady has been in the business for 25 years, serving successively as bookkeeper, treasurer, secretary-treasurer, and finally as vice-president of a concern whose three plants do a business of more than $1,000,000 annually.

When she took the position of bookkeeper in 1927, Mrs. Mitchell determined to learn all she could about the stone and sand business. Her quest of knowledge of every phase of the company's operations led to her present important post. Mrs. Mitchell is also a director of the North Jersey Quarry Company.



Left: Well drill converted for jet piercing at Consolidated Quarries Corp., Lithonia, Ga.

Below: Another view of modified well drill, showing operating platform and duct for discharging waste gases.



Association Promotes Building Of California Truck Highway

Aggregate trucks from various plants in the San Gabriel Valley drive over the new road after the ribbon-cutting ceremonies.

ONE of the outstanding developments in public relations in the sand-and-gravel industry in some time is the recent accomplishment of the Southern California Rock Products Assn. in solving the problem of extremely heavy truck traffic through areas where residential and business growth have made this traffic unwelcome.

The San Gabriel Valley, lying east of Los Angeles, contains the great gravel deposits of the debris cone of the San Gabriel River. Small developments were begun here as early as 1907, with increasing volume as the spectacular growth of southern California continued until the present annual tonnage shipped from the 13 producing plants located on the San Gabriel River debris cone exceeds 9,000,000 tons. Over 90 percent of these aggregates are transported by trucks.

With the exception of the material moving directly west into the Pasadena and Alhambra areas and easterly toward Covina and Pomona, the great bulk of this tonnage was hauled over Peck Road from the plants on the west side of the cone and over Irwindale Avenue and through the Baldwin Park district from the plants on the east side of the cone. Truck traffic on Peck Road sometimes reached a peak of 240 vehicles per hour!

Over a 5-year period, working with the various civic organizations of the San Gabriel Valley and the Los Angeles County Road Department, a new traffic artery was suggested by the Southern California Rock Products Assn. for the relief of the serious traffic situation. A survey by the County Road Department showed that such a highway could be built along the west bank of the San Gabriel River in the Los Angeles County Flood Control Channel which would attract this truck traffic and furnish a 3½-mile straight route from Arrow Highway to Garvey Boulevard, with only one stop. It was to be called the River Grade Truck Highway.

This projected highway is now a reality and the trucks are rolling. A grand opening ribbon-cutting ceremony was held at 11 a.m. on May 11 at which representatives of all the civic organizations of the San Gabriel Valley were present, including women's clubs, Parent Teacher Associations, city officials, county supervisors, the County Road Department, the California Highway Patrol, and the Greater Los Angeles Chapter of the National Safety Council. In addition, members of the Southern California Rock Products Assn. and operators of the sand-and-gravel plants in the area were well represented. A buffet luncheon was served to over 400 guests following the opening ceremonies.

According to H. G. Feraud, executive secretary of the aggregates association, great credit is due County Supervisor Herbert Legg and Los Angeles County Road Commissioner Sam Kennedy, without whose co-operation and efforts this project would never have been possible.

At International Minerals & Chemical Corporation's new hydrochloric-acid-magnesium-oxide plant nearing completion at Carlsbad, N. M., full production is scheduled to get underway early in July. This chemical unit will produce large tonnages of hydrochloric acid and various high-purity magnesium oxide products from magnesium chloride brine, a by-product of potassium sulphate production.

The 13 plants (see locations on map) served by the new highway are as follows: (1) Consolidated Rock Products Company's Largo plant, (2) Azusa Rock & Sand Company, (3) Livingston Rock and Gravel Company, (4) Manning Bros. Rock and Sand Company, (5) Consolidated Rock Products Company's Irwindale plant, (6) California Materials Company, (7) Arrow Rock Company, (8) Blue Diamond Corporation, (9) Owl Rock Products Company, (10) Pacific Rock and Gravel Company, (11) Sierra Rock Products Company, (12) Consolidated's Sierra plant, and (13) Graham Bros., Inc.

30 years ago in Pit and Quarry

By WALTER E. TRAUFFER

THE July, 1923, issue of PIT AND QUARRY featured a complete report of the annual convention of the National Lime Association, held June 13-15, 1923, at the Commodore Hotel, New York City. A high point of the meeting was the presentation to Charles Warner, retiring president, of a beautiful silver service. The new officers elected were as follows: George Wood, president; Fred Wittmer, vice-president; Burton A. Ford, secretary; Milton McDermott, treasurer.

In his opening address Mr. Warner commented on the excellent business conditions in the industry, and on the growing demand for lime by the chemical and construction industries. W. R. Phillips, general manager, described the many activities of the association. He pointed out that the association was supporting 12 to 15 full-time fellowships at various colleges and universities and that this research was paying off in opening up new markets for lime. It was announced at this meeting that Mr. Phillips was resigning from his position to become sales manager of the American Lime & Stone Company. He was to be succeeded by J. A. Slipher, the association's soil technologist.

Among the many papers presented at this meeting was one on *Late Developments in Quarrying*, by Oliver Bowles, U. S. Bureau of Mines. *The Efficiency of Lime Burning* was discussed by Victor J. Azbe, consulting combustion engineer of St. Louis. This paper was reprinted in full. Mr. Azbe pointed out the savings most plants could make by improving the fuel efficiency of their kilns. Many kilns, he said, were operating at only 20 to 25 percent efficiency, when up to 50 percent was possible. All of the many specialists employed by the association also reported on their work.

A report from PIT AND QUARRY'S Washington correspondent said that the National Sand and Gravel Association was incorporated on June 18. This new status, said N.S.G.A. Secretary Barrows, "meant that the association could now sue and be sued."

This issue was heavy on sand-and-gravel plant operating articles; five outstanding operations were described, four of them using suction dredges. One was the dredging plant of the Lincoln Sand and Gravel Company of Lincoln, Ill., which was headed by the late V. O. Johnson. Much emphasis was placed on the success with which "Buck" Weaver kept the orders coming in and Superintendent H. E. Clouse kept filling the cars.

Another article by Victor J. Mill, described the gravel dredging operation of the Fuller-Becker Sand & Gravel Company at Oxford, Mich. Two 15-in. pumps in series delivered material up to 3,000 ft. to the screening plant, the booster pump being located on the shore of the dredge pond. This plant had a capacity of about 250 t.p.h.

Another dredging operation described was that of the Central Michigan Gravel Company at Lansing, Mich. A power shovel had been used to work the 75-ft. high, 1,500-ft. long face; but conditions favorable to dredging induced the owners to install an 8-in. suction dredge, and a new screening plant was built at the same time.

The fourth dredging operation described was that of the Ohio Gravel Ballast Company at Miami Grove, Ohio. This was originally a shovel loading plant which went to shallow water dredging when the dry deposits ran out. When this material also ran out, a suction dredge with a screen nozzle agitator and ladder was installed, which made it possible to excavate to 40 ft. below water level.

The Albany Gravel Company's plant at Albany, N. Y., was a dry operation working a 100-ft. high face of sand and gravel with a drag scraper. A concrete products plant was under construction to use up a surplus of fine materials.

A brief illustrated article showed the right and wrong ways to crimp a blasting cap on a piece of fuse.

A lengthy item gave the pros and cons of the proposal to build a state cement plant in California. A group of California legislators behind the plan were apparently opposed by most of the press and the public. PIT AND QUARRY'S attitude was that such an invasion of a private manufacturing business by any government could be justified only by a great emergency; that no such emergency existed or was in prospect in California.

Many new plants and plant expansions were in the news. Most important of these was the $1,000,000 expansion under way at the plant of the Sun Portland Cement Company at Boise, Idaho. The capacity of this operation was to be increased to 1200 bbl. per day.

New Construction Totals Up 10 Percent in May, 1953

New construction expenditures rose 10 percent during May to $2,900,000,000, and were 6 percent above those of May, 1952, according to preliminary estimates of the U. S. Labor Department's Bureau of Labor Statistics and the Building Materials Division of the U. S. Department of Commerce. Although most of the April-May rise occurred on private residential construction and roadbuilding, adverse weather kept these types of work from rising as much as usual in May. Total private expenditures were up 8 percent from April to almost $2,000,000,000 in May, and public outlays rose 13 percent to $933,000,000.

New construction activity as a whole totaled a record $12,600,000,000 for the five months from January to May, 1953, almost 6 percent above the 1952 figure for the same months. Private construction, with a value of $8,700,000,000, accounted for nearly the entire gain over last year, largely from increased outlays for new dwelling units and commercial building. Public expenditures totaling $3,800,000,000 were but slightly above the January-May, 1952, total, as lowered activity on public housing, hospitals, and federal reclamation and development work offset the moderate gains for other types of public building.

Private spending for residential building advanced almost 9 percent during May to $987,000,000, and was 7 percent above the May, 1952, estimate. Despite a rainy spring, total expenditures thus far in 1953 for new work on private residential building amounted to more than $4,300,000,000—almost 9 percent above the January-May, 1952, total. Nonhousekeeping residential building (including motels, hotels, and dormitories) showed significant increases over the year; outlays of almost $100,000,000 were 56 percent more than in 1952 for the first five months.

May expenditures of $128,000,000 for commercial building were at the highest monthly rate in two years, and an even higher figure seems likely for June. Well over $500,000,000 was spent during the first five months of 1953 on the construction of new offices, stores, and other types of commercial building, compared with the $387,000,000 spent during the like 1952 period.

Private industrial construction remained strong in May, with outlays almost equalling the April first. For the first time in 11 months expenditures for this work were above the year-ago level.

Highway expenditures advanced almost 50 percent last month to $250,000,000, but the 1953 total thus far ($740,000,000) was only slightly above outlays during the January-May, 1952, period. After a seasonal rise in May, military and naval expenditures for new construction totaled $530,000,000 for the first five months of 1953—about 6 percent over the like 1952 period.

● Correction

Due to an unfortunate error, a unit pictured on page 104 of our May issue was incorrectly identified. In the article the equipment was described as a Schaffer Poidometer. Actually, it is a Hardinge Constant Weight Feeder. We sincerely regret the publication of the incorrect designation.

According to word from Panama, the outlook for cement manufacturing in this republic during 1953 is excellent. Cemento Panama, S.A., expects to raise production to approximately 2,400,000 bags of 94 lb. each this year. During 1952 the output was 2,179,981 bags. Officials stated that about 49 percent of last year's output was exported, 34 percent used in Panama, and 17 percent sold to the Canal Zone.

Rock Products and Quarry Special

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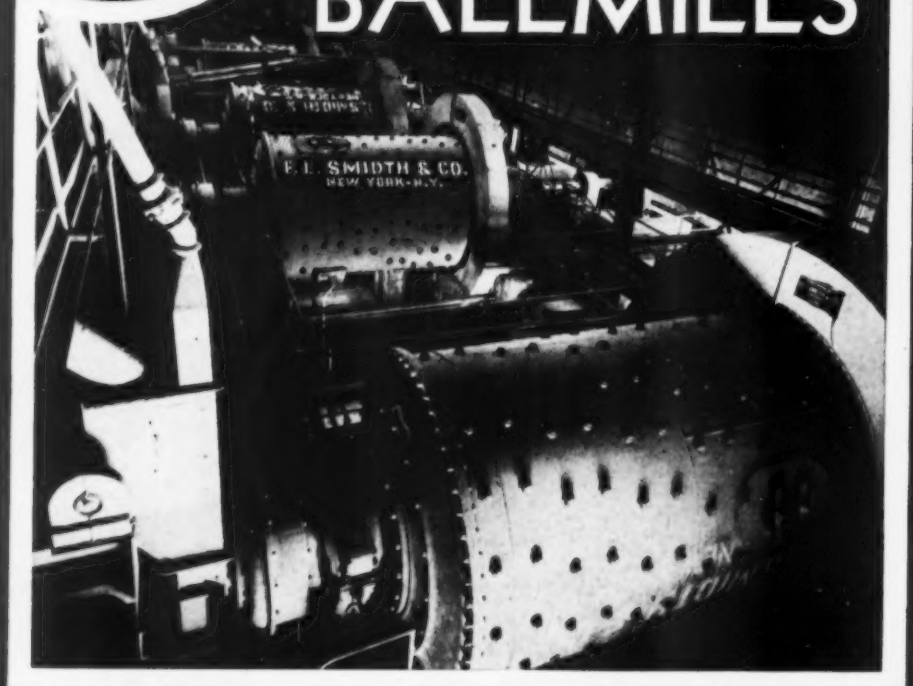

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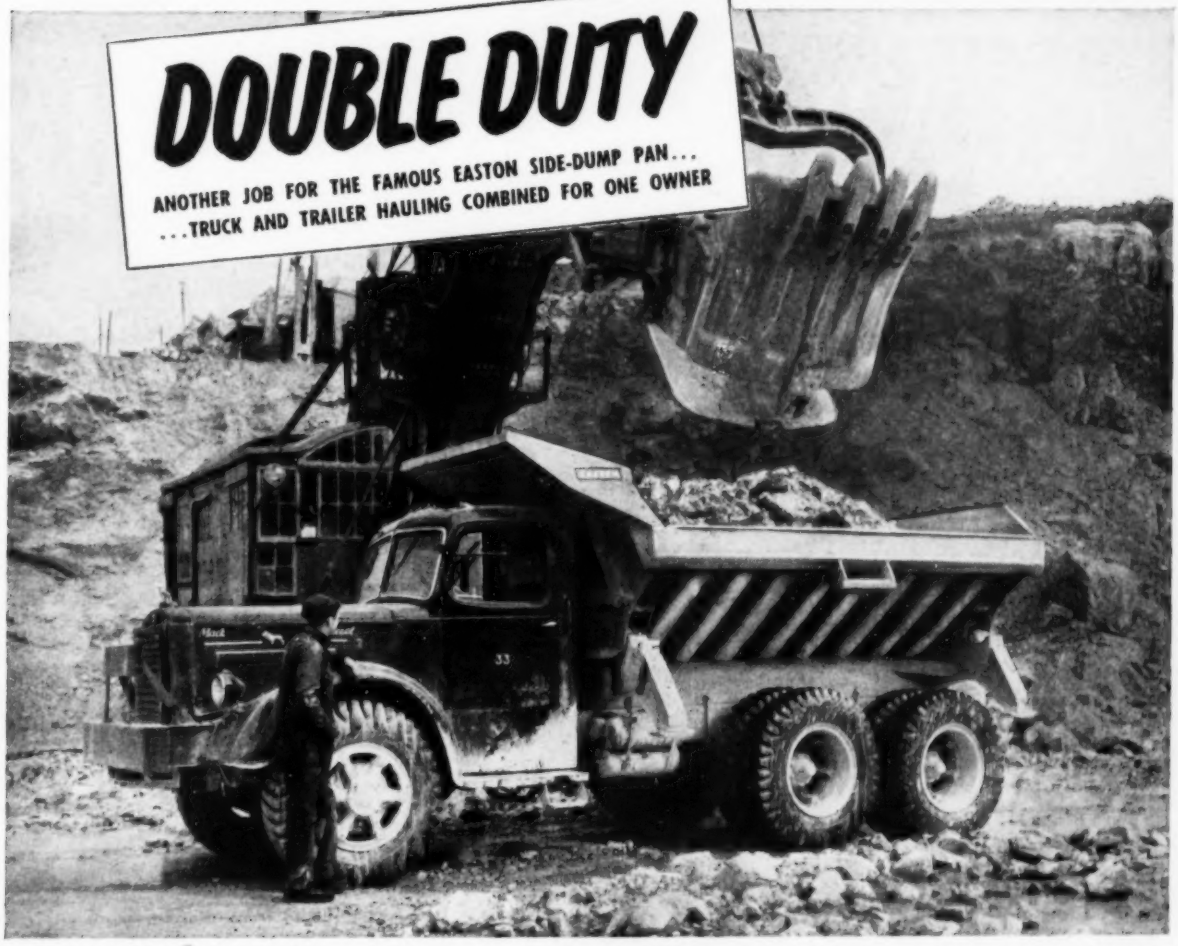

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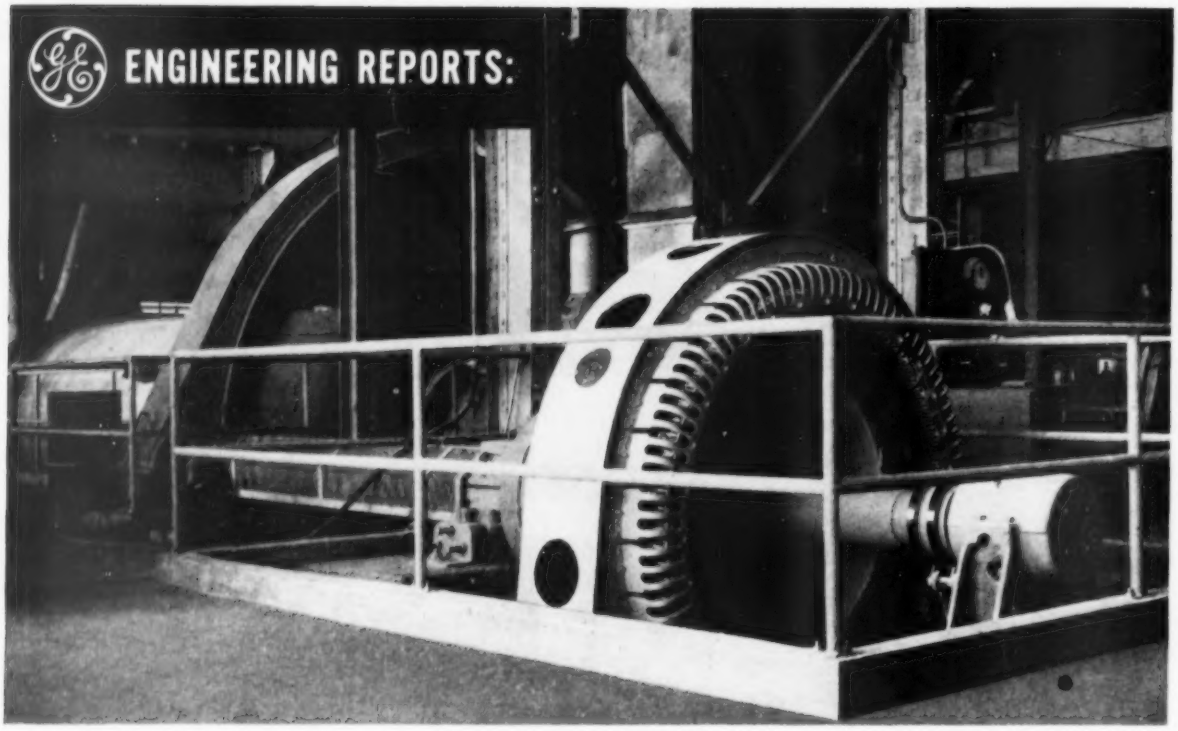
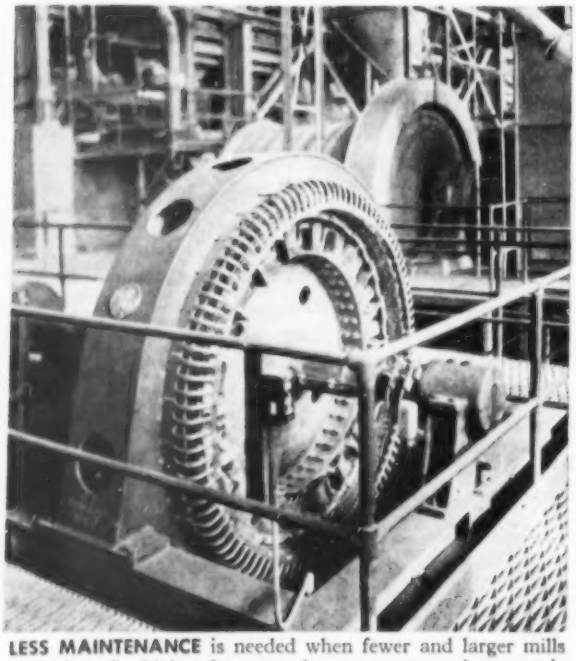
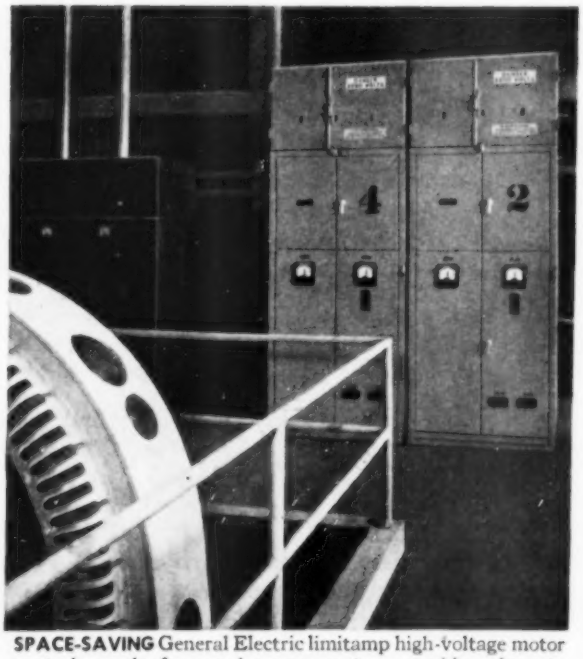


HIGH OPERATING EFFICIENCY is inherent in G-E low-speed high-voltage synchronous motor drives for large pulverizers. In a California cement plant, eight of these General Electric synchronous motors are used to drive the finishing mills.

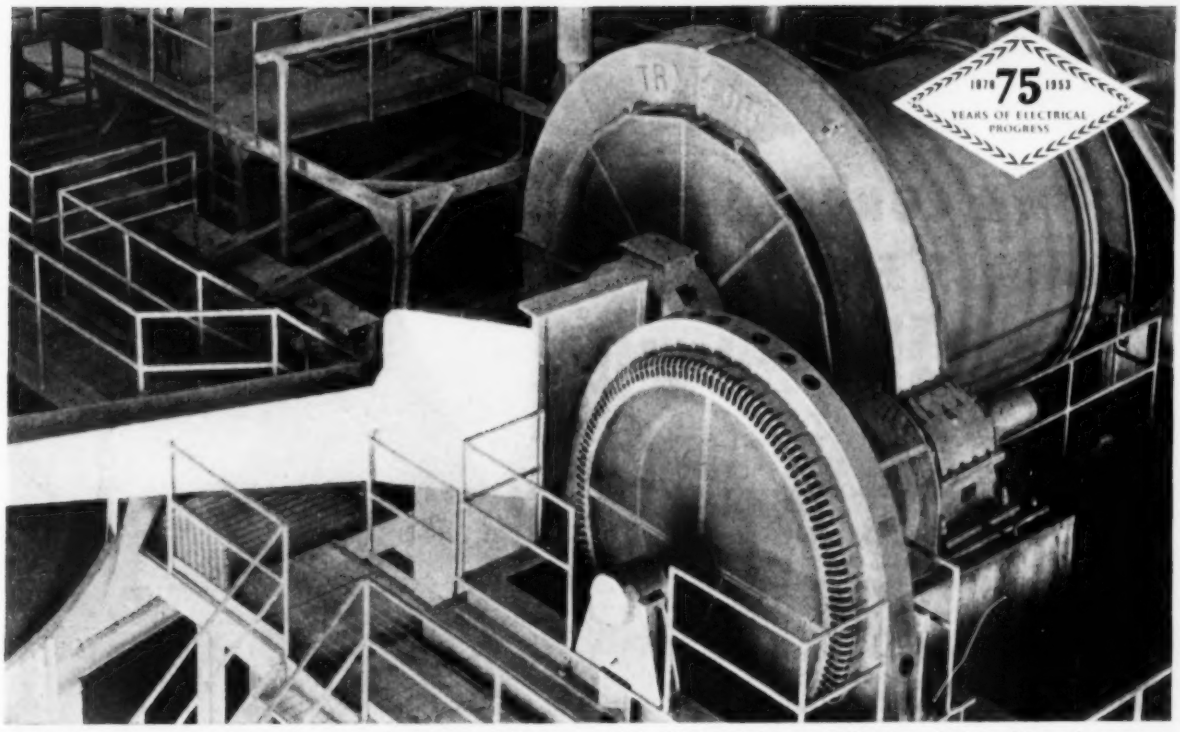
High-voltage drives for large



LESS MAINTENANCE is needed when fewer and larger mills are driven by high-voltage synchronous motors. An example is this G-E 500-hp, 2300-volt unit driving a ball mill.



SPACE-SAVING General Electric limitamp high-voltage motor control panels for synchronous motors provide adequate short circuit protection with high-IC current-limiting fuses.



IMPROVED POWER FACTOR that cuts plant power bills is another advantage of General Electric synchronous motors.

This 500-hp, 180-rpm, 4160-volt unit in a Colorado cement plant drives a primary wet ball mill that is used in raw grinding.

pulverizers boost cement output

G-E APPLICATION ENGINEERS, experienced in cement plant problems, plan and integrate electrical systems to meet your plant's specific needs.

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One way to cut unit costs per barrel of cement today is through greater continuity of production—using large, high-output pulverizers driven by efficient, high-voltage 2300- or 4160-volt motors and control. Many cement plants, for example, have found it pays to replace several small units with a single large mill driven by a General Electric high-voltage synchronous motor with limitamp control. Maintenance is less, output higher. Moreover, with power distributed at high voltage, power losses and first costs are cut.

Money-saving, production-boosting drives like these are used by General Electric engineers when they plan and integrate an electrical system to meet *your* cement plant's particular needs. Find out how they can help you modernize electrically today to increase your cement output tomorrow. G-E engineers can also show you how you can modernize step by step to keep today's production going. Contact your nearest G-E Apparatus Sales office and ask for Bulletin GEA-5469, or write to General Electric Company, Section 658-10, Schenectady 5, New York.

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GENERAL ELECTRIC

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There's reason for ABK Metal's success in this and similar installations where abrasive wear is a major maintenance factor. The controlled structure of this nickel-chrome iron makes it more resistant to abrasion than other metals of the same hardness. The hardness of ABK Metal can be specified from 500 to 700 Brinell.

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M53

Capacity of Maine Cement Plant Increased to Meet Swelling Demand

WHEN the Lawrence Portland Cement Company, now the Dragon Cement Company, Inc., built a new 100,000-bbl. per month plant at Thomaston, Maine, in 1928 to supply the needs of the New England states, all indications pointed to a growing

By WALTER E. TRAUFFER

The approach to the recently enlarged plant of the Dragon Cement Company (formerly the Lawrence Portland Cement Company) at Thomaston, Maine.

demand. Due to the depression and its long-drawn-out aftermath in this area the capacity of this plant was never realized. It was decided, therefore, to join up the two 11- by 200-ft. kilns into one 356 ft. long, for more economical production. This project was completed in January of 1945. Capacity was reduced to 75,000 bbl. per month but fuel consumption was lowered from 115 lb. to 85 lb. of coal per bbl.

By 1947 business conditions in New England improved considerably, and the demand for cement exceeded the capacity of the plant. It was then decided to increase the capacity, but a new kiln could not be obtained. This problem was solved by purchasing two 9½- by 8½- by 150-ft. kilns from a Canadian plant and combining them into one kiln 200 ft. long. The piers of the old 200-ft. kiln and one of the old coolers were used. This installation went into operation in July of 1947 and was intended to be only temporary; it was to be used about three months each year. The demand kept increasing, however, and this kiln was in constant operation, except when repairs were necessary, until it was dismantled in January of 1952 to make way for still another new kiln. This kiln had a capacity of about 27,000 bbl. per month, bringing the capacity of the plant back to its original 100,000 bbl.

It was decided, late in 1951, to install a new and longer kiln in place of the 200-ft. kiln, and the building was extended for it. Everything was planned for the least possible loss of time between the stopping of the old kiln and the starting up of the new one. The falsework used for dismantling the old kiln was used for erecting the other. Considerable ingenuity was required to do this inside the building, but it could not otherwise have been done outdoors during the winter because of the severe cold and heavy snow.

Two kilns operating under identical conditions allow comparison between slurry filters and kiln chains

When this picture was taken, the last section of the new 11- by 356-ft. kiln was being rolled into place. The same falsework was used for dismantling the old 200-ft. kiln.

The new 11- by 356-ft. F. L. Smidth kiln has six tires spaced to fit the four existing piers and the two new ones built for it. This kiln was in operation on May 1, 1952, only four months after the old one was dismantled. It is producing at the rate of 75,000 bbl. per month, making the plant capacity 150,000 bbl. per month. Actually this plant produced 1,578,000 bbl. of cement in 1952.

It was not necessary to make any major changes in the raw- and clinker-grinding departments in order to take care of the increased out-

put. The two raw mills were Allis-Chalmers 7- by 8- by 40-ft. 3-compartment Compeb mills, and these were converted to straight tube mills. By speeding them up, optimum efficiency was obtained and the capacity was increased from 24.5 up to 36.9 t.p.h. each, grinding to 86 percent through 200-mesh. These mills now have about 15 percent excess capacity over kiln requirements.

The two 7- by 8- by 40-ft. Allis-Chalmers 4-compartment Compeb clinker grinding mills were also converted to straight tube mills. By installing a clinker crusher ahead of them, speeding them up, and changing the load, their capacity was increased from 90 bbl. to 115 bbl. per hour each when grinding to 92 percent through 200-mesh for Type I and II cements. In order to increase the grinding capacity, a 10- by 18-ft. ball mill is now being installed which will have a capacity of 140 bbl. per hr. This mill will have a 1,000-hp. motor and a 16-ft. separator. The additions of this unit will make it possible to operate the plant at an annual capacity of 2,000,000 bbls. of cement. The present mills will not quite hold their own with the kilns.

The new 11- by 356-ft. Smidth kiln is of all-welded construction and is driven by a 150-hp. Reliance d.-c. motor at a speed of 1 r.p.m. The kiln was originally equipped with a 92-ft. chain section; but the raw material leaving them was dry, so they were cut down to 70 ft. The material now leaves them with about 6 percent moisture. Beginning at the discharge end, the kiln is lined with 36 ft. of basic magnesite brick, 16 ft. of 70 percent alumina, 16 ft. of 60 percent alumina, 12 ft. of 50 percent Superduty, 150 ft. of Armstrong insulating brick, 50 ft. of clay brick, 66 ft. of wear resistant, and 10 ft. of clay brick. No nose ring is used in the kiln—the basic brick runs out even, and a coating is built up there by pulling the flame back to the end of the kiln.

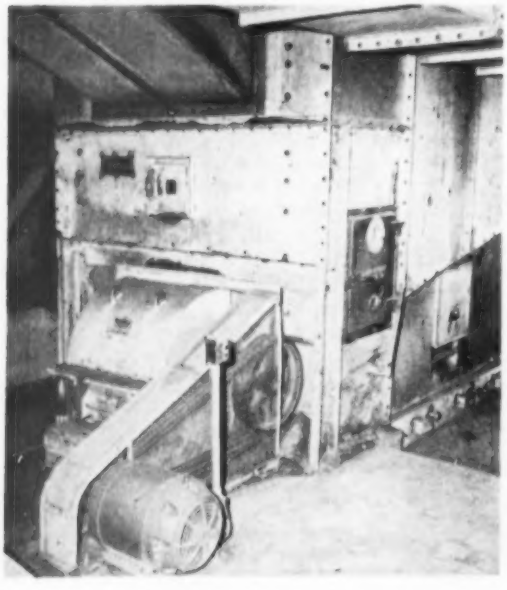
The arrangement of the screen and the mixing screw and bowl for blending reclaimed stack dust with slurry.

The clinker is discharged at a temperature of 2,500 to 2,600 deg. F. into the 32-ft. Fuller inclined grate cooler. There is a 2-ft. cut-back dead plate at the feed end of the cooler, so that the cold air hits the plastic clinker before it lands on the grates, air-quenching it. The clinker is discharged from the cooler at 225 deg. F. through an attached crusher. Cooling air is provided by a 75-hp. fan and is fed through the entire length of the grates. A 60-hp. fan draws off the low-temperature air through a damper control which is not changed once it is properly adjusted. This air passes through a Multiclone dust collector to atmosphere. The hot air at the feed end of the kiln is secondary air from the kiln at a temperature of 850-900 deg. F.

The kiln is fired with Bunker C fuel oil through an Enco mechanical atomization single-jet burner. Fuel consumption averages 7.8 gallons per bbl. of the 18,300 B. t. u. oil. The oil is received daily in tank trucks from tidewater storage and discharged into tanks with a 7-day supply of about 330,000 gal. Received at about 110 deg. F., the oil is heated in these tanks to about 120 deg. It is then pumped through heating units which raise the temperature to 250 deg. F. at a pressure of 300 lb. A Superior 100-lb. boiler and an Enco heat exchanger are used on each kiln, the steam being fed to the exchanger through temperature and pressure regulators. Primary air for the burner is provided by a 12,000-c.f.m. fan with a control damper.

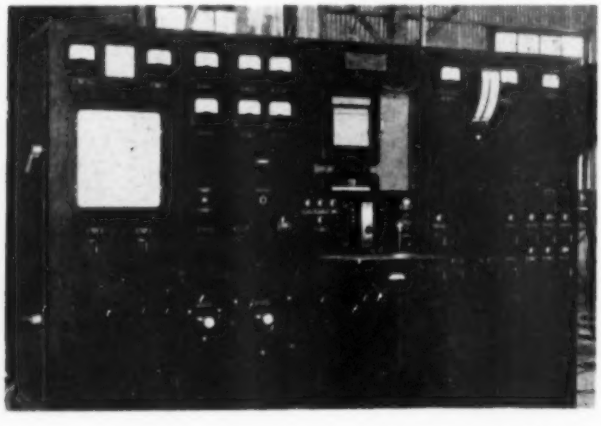
In reserve in case of an oil shortage, price increase or other reasons is a complete coal-handling and firing system for each kiln. These consist of Raymond direct-firing bowl mills complete with coal scales, feeders, etc. The change to coal firing can be made on less than a week's notice.

The exit gases from the kiln are discharged through dust chambers to Buell dust collectors and the two original stacks. These collectors salvage about 80 percent by weight of the dust, dispersing in the atmosphere the extremely fine dust containing the high-alkali fractions. Slurry is fed to the kilns by a ferris-wheel feeder driven by a d.-c. motor which is synchronized with the d.-c.



Left: The inclined-grate clinker cooler, with its attached crusher on the new kiln.

Below: The control board for the new kiln, which is to be extended to accommodate the older kiln, as well.



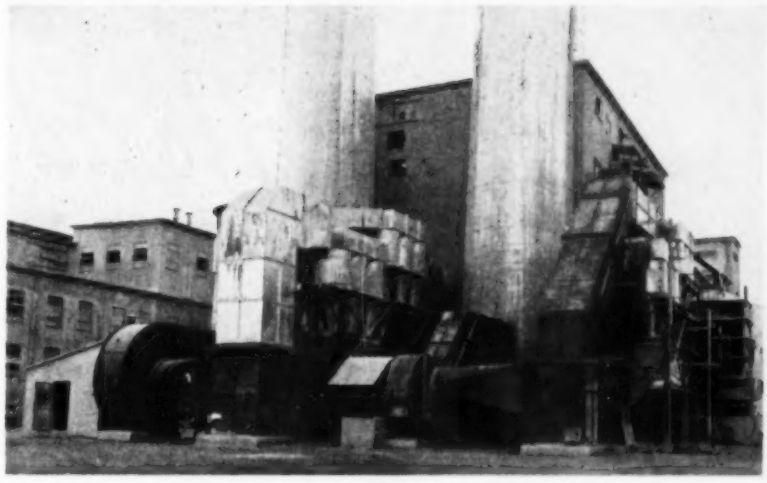
kiln motor through variable-voltage control to give uniform feed. Dust recovered at the stack is fed back to the kiln after being mixed with water in a pug mill. The straight slurry, with a water content of 33 percent, and the dust slurry with 35 percent moisture, are blended in a mixing bowl, with the dust slurry forming 8 percent of the total slurry volume. A 4-in. Wilfley pump is used as a homogenizer. Feed to the kiln is through a 4-in. water-jacketed pipe.

Burning in the kiln is done at a temperature of 2,900 deg. F., and the exit gas temperature is about 600 deg. F. The control equipment includes all the standard instruments, which are mounted on a new F. L. Smidth control board. This panel is being extended to carry all controls for the older kiln as well. There is also a Leeds-Northrup gas analyzer which records the oxygen content. This instrument automatically controls the damper setting through an electronic control developed at this plant.

The older kiln is also 11 ft. in dia. by 356 ft. long and is driven at a speed of 1 r.p.m. In size and in every other respect it is practically identical with the new kiln, except that it is preceded by slurry filters and is not equipped with chains. This gives an excellent opportunity to compare these two types of operation. The slurry cake from the Oliver disc filters contains 8 percent moisture. Stack dust from the collectors is added to form 8 to 10 percent of the total, and this reduces the moisture to 15 percent. Burning is done at 2,900 deg. F. and the exit gas temperature is 1,100 to 1,150 deg. Fuel oil consumption averages about 7.7 gal. per bbl., almost exactly the same as in the newer kiln. The older kiln has a 6- by 29-ft. Fuller grate cooler which has no clinker breaker and consequently does not require a dust collector.

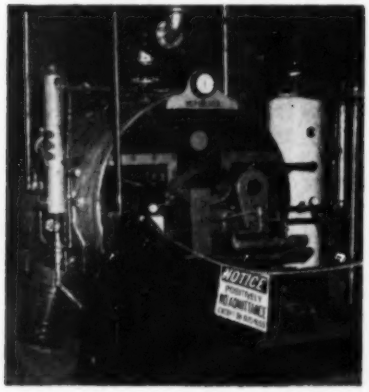
The original quarry near the plant has been used ever since the plant was built to supply its needs and those of the lime plant which had been operated by the company until December, 1949. This quarry could be used for many more years but it is getting rather deep for economical operation and the rock, because of its complicated structure, is difficult and expensive to blend. The company, fortunately, has deposits across U. S. Highway No. 1 from the plant which would be easier to blend and more economical to quarry, and it is planned to tunnel under the highway to open them up. Stone from the old quarry varies from 26 to 55 percent CaO. The other ingredients also vary widely but with generally the same relation to each other.

The control methods now required begin in the quarry. Before each blast samples are taken from each well drill hole. There is also an automatic sampler on the belt conveyor from the crusher building to storage. The rock is stored in layers, with the high-calcium material on one side and the low-calcium on the other. The overhead crane reclaims the stone in layers also, feeding the two types in the required proportions into the raw mill feed bins. The slurry from the mills is pumped into a 30,000-gal. tank, from which it is pumped out at intervals to the correcting tanks. The mill stream is sampled to detect trends up or down, so that corrections can be made at the mill feed. The composite in the big tank is also sampled hourly, so that trends can be controlled from the blending tanks. The contents of the blending tanks are sampled before the blended slurry is fed from the mill tank into the kiln feed basin, which has capacity for one day's operation of both kilns. All tanks are equipped with mechanical and air agitation.



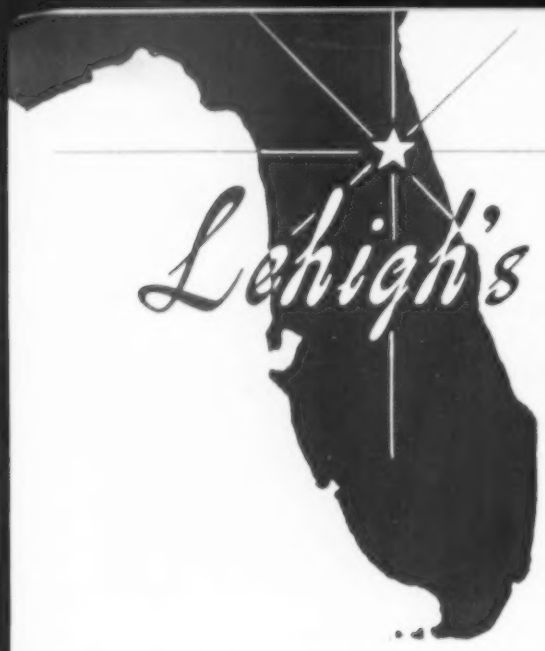
The two concrete kiln stacks, with draft fans and dust collectors.

Ruhm Phosphate & Chemical Company, which operates a raw ground rock phosphate plant at Columbia, Tenn., will move its central offices from Chicago to Columbia. Sales offices are located in Benton, Ind., and La Salle, Ill.



Left: The 100-hp. boiler which provides steam for heating the fuel oil used for kiln firing.

Right: Standing before the new kiln are the following: James H. Ackerman, president of Dragon Cement Company; W. H. Klein, vice-president; and John M. Pomeroy, vice-president in charge of this plant.



Lehigh's Florida Mill

NOW IN FULL SCALE

New plant, first to use coquina as source of calcium carbonate, to make 1,400,000 bbl. annually.

★ ★ ★ ★ ★ ★ ★ ★

By WILLIAM M. AVERY

Henry P. Burks, plant manager of the Lehigh Portland Cement plant at Bunnell, Fla.

An aerial view of Lehigh's new wet-process plant at Bunnell, Fla. The various departments shown may be identified by referring to the plan views on pages 100 and 101.

PRODUCTION

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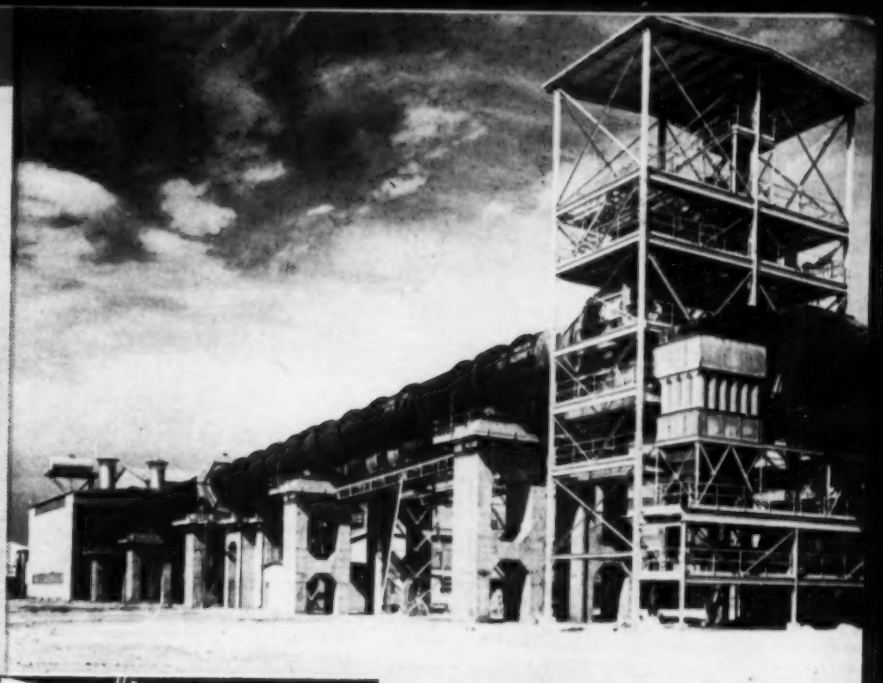
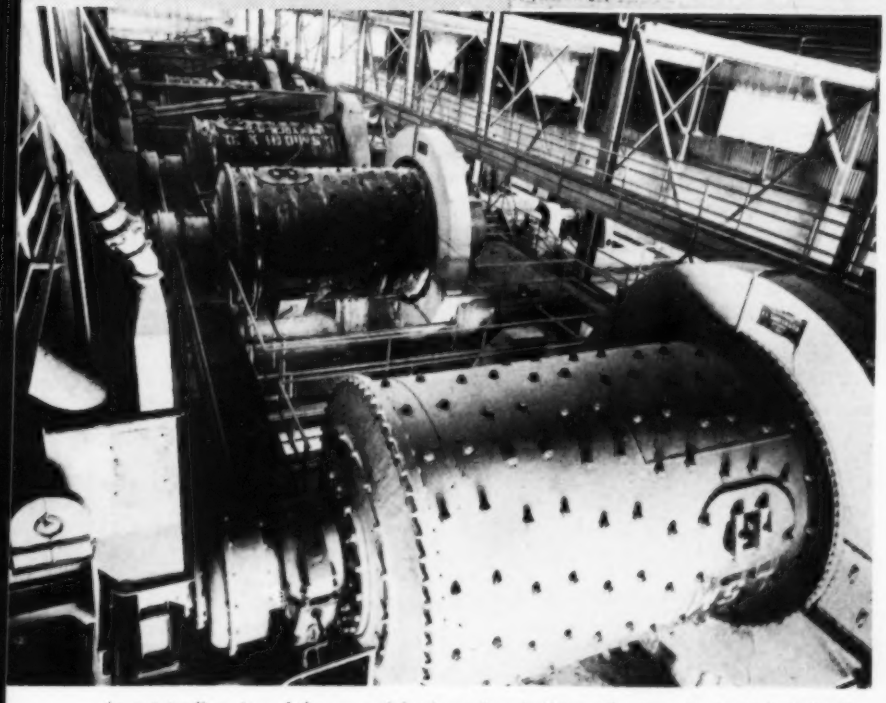


The two 10½- by 380-ft. rotary kilns, looking from the feed end. The kilns exhaust through multiple-cyclone dust collecting units.



An outstanding view of the raw-and finish-grinding facilities. The three 10- by 15-ft. ball mills in the foreground are used for clinker grinding; the units in the background for raw grinding.

ON THE SPOT

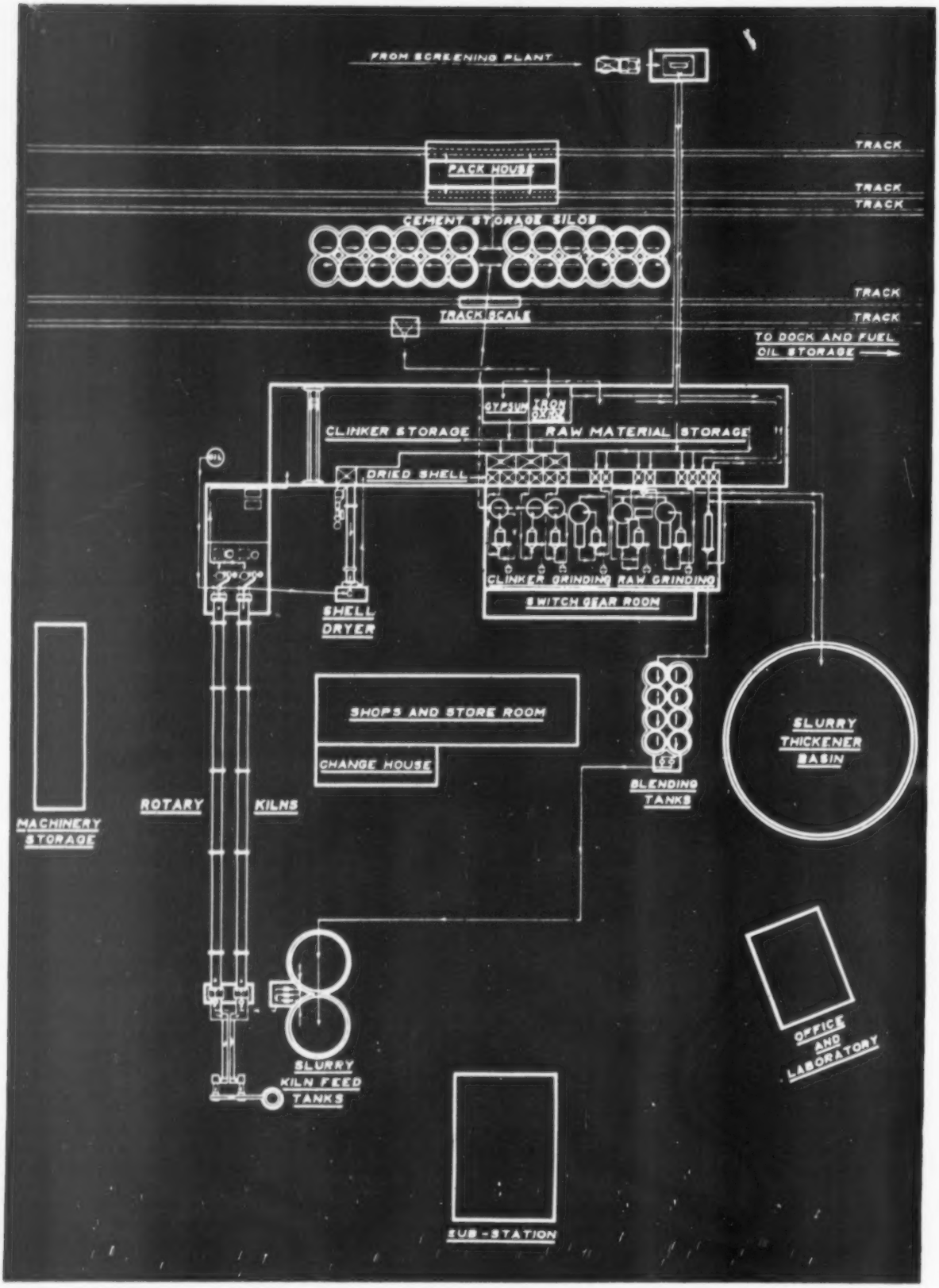
AMONG the many newsworthy features of Lehigh Portland Cement Company's plant at Bunnell, Fla., is the major relief the new facilities will provide from the chronic cement shortages which have hampered building throughout the Florida peninsula ever since the close of World War II. A substantial share, if not all, of the anticipated 1,400,000-bbl. annual output of the plant will be marketed within the state to help meet demands which last year resulted in the purchase of almost 7,000,000 bbl. of United States-manufactured portland cement.

Entirely apart from the far-reaching importance of the Bunnell plant in easing a touchy and long-standing supply problem, the installation fairly bristles with features well calculated to excite the interest of cement plant technicians, operators, and designers. One of the outstanding features of the $14,000,000 two-kiln plant is that the process design was predicated entirely upon the use of coquina shells as a source of calcium carbonate. Although prehistoric beds of oyster shells have been, and are still being, used as sources of calcareous material in the manufacture of portland cement, the Bunnell plant is the first in the entire industry designed to use shell fragments of the small edible bivalve which the early Spaniards called coquina.

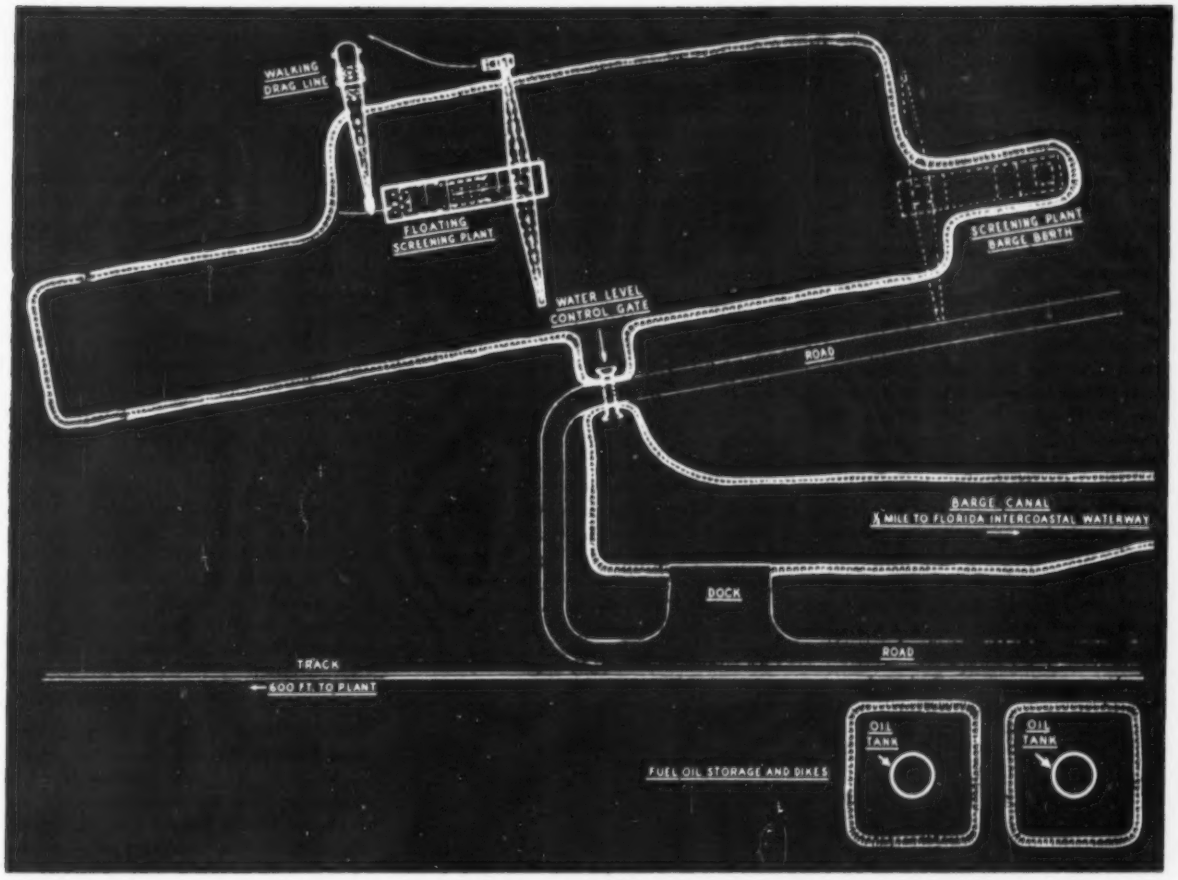
This somewhat unorthodox raw material source has quite naturally had a very direct effect upon process design, especially in the raw preparation stages. For example, although the deposit from which the plant is supplied is definitely inland, it was found most expedient to install all the facilities for screening and washing the shell on a large barge, which can be readily maneuvered in the slips dug by the walking dragline as it recovers the raw shell.

The plant is a wet-process installation, and it incorporates single-stage grinding with relatively short ball mills in the raw section. Another noteworthy feature is the inclusion and use of facilities for four-component raw grinding. This has been accomplished by operating a Unidan mill which by-passes the large slurry thickener basin.

Manpower efficiency for the entire operation appears to be exceptionally high, reflecting the long-term trend throughout all branches of industry to achieve a high degree of automatic operation and control. In the case of the new Lehigh mill, all phases of



A plan view of the Bunnell plant, showing the general arrangement of productive facilities, the main buildings, slurry basins and tanks, storage silos, packhouse, sub-station, office and laboratory, and the railroad siding.



This drawing shows the relative position of the quarry, the barge canal which enters the property from the Intercoastal Waterway, and the fuel oil storage tanks.

production represent approximately 0.21 man-hours per bbl. of finished product.

Another immediately discernible characteristic of the Bunnell mill is the safety engineering which is apparent in every department of the plant. No reasonable expense has been spared in any phase of the process to assure that the new plant will join other divisions of Lehigh in contributing to the fine safety performance of the cement industry as a whole.

Why Florida? The possibility of a Florida mill location is by no means a matter of recent consideration within the Lehigh organization. Some of the first domestic portland cement ever used in the state was shipped by Lehigh *via* water from Jersey City a half century ago, and for the last 30 years the company's plant in Birmingham has been an important source of supply. Prompted by the large volume of its Florida business during the 1920's, Lehigh purchased some 2,000 acres of limestone and clay property near Ocala, with the thought of building a mill in that location.

This project was finally abandoned during the depression years, and when the whole matter was restudied some years later, it was determined that an East Coast location had the best possibilities from the standpoint of both transportation and distribution. In consequence, about a decade ago the company launched an exhaustive search for raw materials along the entire Atlantic coast line of the state. Serious consideration was given to the possibility of obtaining the necessary calcareous material from oyster shell beds located in the marshlands of the St. Johns River near Jacksonville. There were many indications, however, that this source of material might result in excessively high operating costs, and

A view of the attractive general office building, constructed of concrete masonry.

extensive surveys failed to show material reserves that were in any way commensurable with total investment.

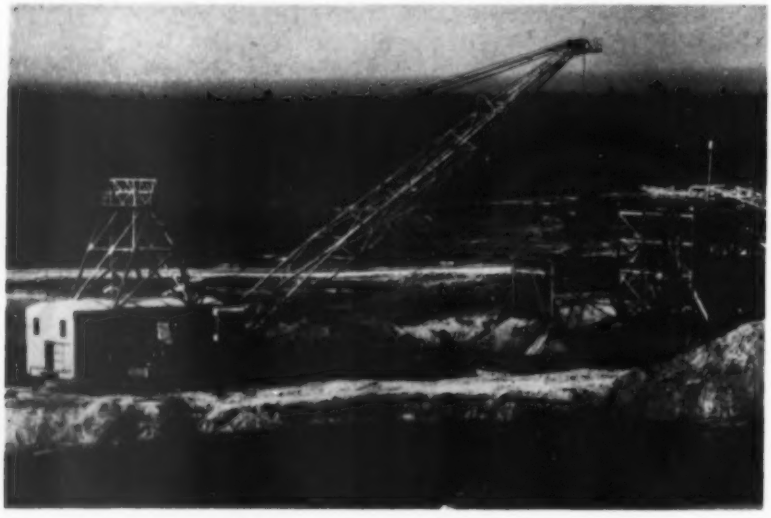
Attention was next focussed upon the coquina deposits on Anastasia Island off St. Augustine, from which the Spaniards who settled this ancient city in the 17th century quarried the coquina rock used in many of the early structures. Although this location proved to be unsuitable for quarry or dredging operations on the scale necessary to supply a modern cement plant, subsequent investigation led to the finding of major deposits of the material west and northwest of Flagler Beach. There the company purchased more than 11,000 acres of swamp and waste land encompassing three distinct ridges of coquina shell. Throughout its entire 8-mile length the property adjoins the Florida Intercoastal Canal. Core drill studies of the ridges have established reserves of shell sufficient to maintain full operations of the plant for more than a century.

Geology Easily the youngest of the 48 states from the standpoint of geology, Florida is believed to have emerged from the sea around the middle of the Cenozoic era. The coquina deposits found in the state are believed to have been laid down during the late Pleistocene (or "most recent") age of the Cenozoic era, when the warm, relatively shallow tropical seas supported countless billions of small bivalves closely related to the clam family. The shells of these small creatures were deposited, layer upon layer, on the Floridian plateau to form the mostly unconsolidated material called coquina.

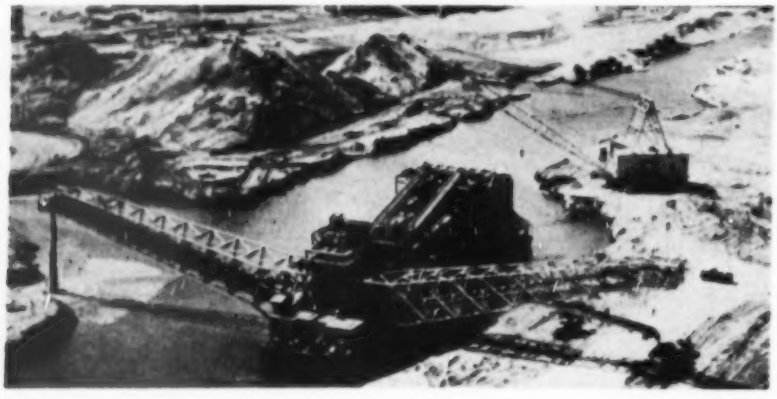
The three primary ridges of coquina which comprise the Flagler Beach property are each from 600 to 800 ft. wide and from 30 to 50 ft. deep. They lie parallel to the Intercoastal Canal and extend the entire length of the property. Chemical composition varies considerably, due to variations in shell-sand ratio, across the ridges, but there is a fair degree of uniformity within each ridge. It is believed that the shells were concentrated in ridges by wave action and ocean currents, a theory which is bolstered by the fact that very low shell contents are found in the sand bars which separate the coquina ridges.

The overburden consists almost entirely of sand, although a capping of 3 to 5 ft. of siliceous clay shows up in a few locations. On Ridge 2, the present location of recovery operations, the sand overburden varies from zero up to the maximum of about 28 ft., with 17 ft. representing an approximate average. The calcium-carbonate content of plus 20-mesh material in this deposit averages about 90 percent. Workable thickness of the ridge varies from 20 to 50 ft.

Consuming approximately 1,100 net tons of shell per day, the present plant facilities require the excavation of about 22 acres of deposit to take care of a year's production of portland cement. Someone has estimated that each barrel of cement produced at Bunnell requires approximately 4,250,000 coquina shells.



Shell material is excavated by a 10-cu. yd. electric-powered walking dragline, here shown charging the feed hopper of the floating screening plant.

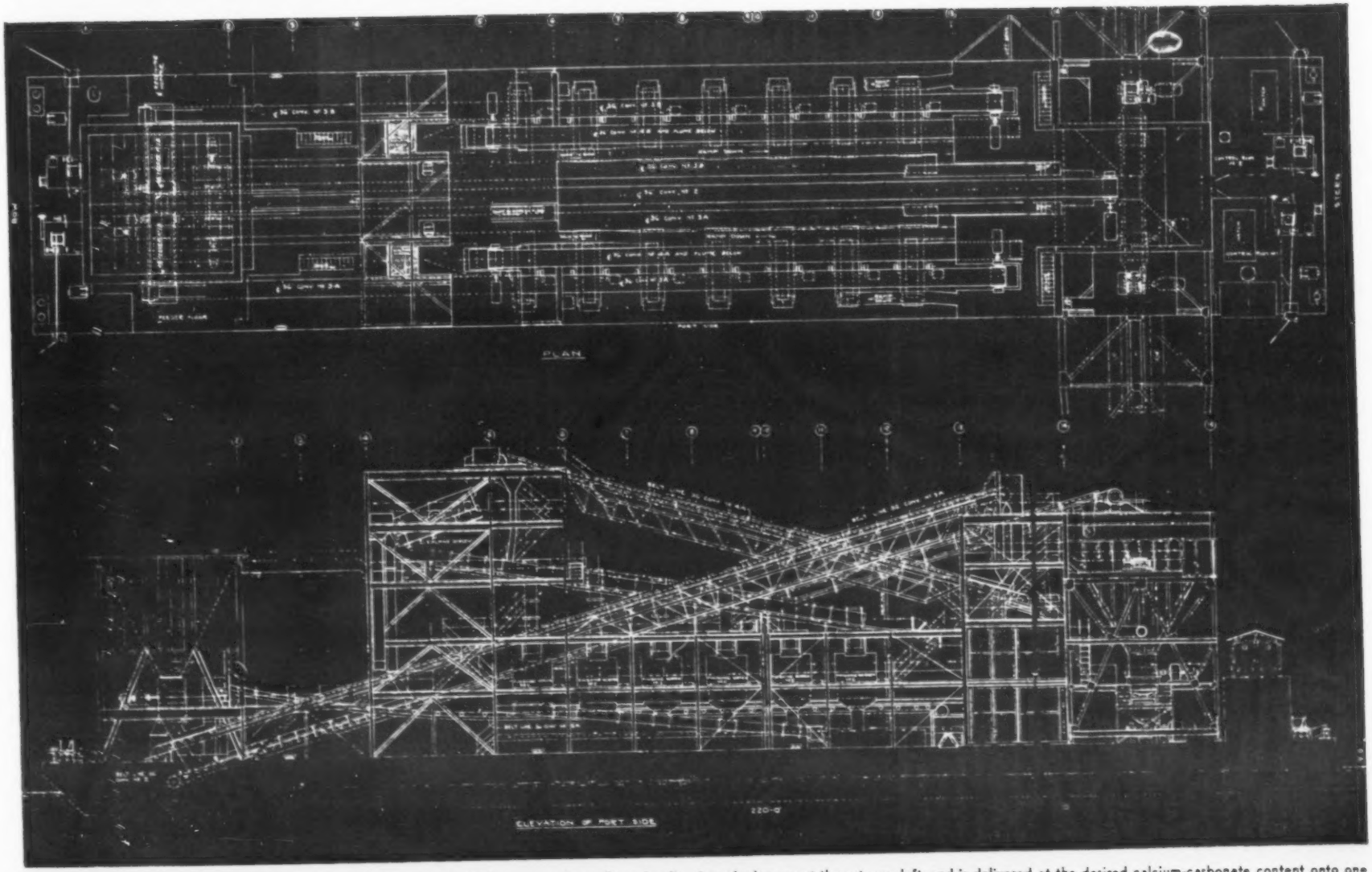


One of the unique features of the Bunnell plant is the use of a floating screening and washing plant for processing a coquina deposit. Mounted on a 44- by 220-ft. steel barge, the plant possesses two identical 165-ft. trussed booms for conveying finished product and waste material.

Excavation and Screening The floating screening plant at Bunnell, consisting of a towering superstructure mounted on a 44- by 220-ft. steel barge, is one of the most striking and unique features of the entire installation. The superstructure was designed and built by Robins Engineers, while the barge proper was built in a New York shipyard of Bethlehem Steel Company and towed to Flagler Beach. The barge has a total depth of 9 ft., and the gross weight, including the superstructure, is 1,300 tons. It draws about 4 ft. of water.

The coquina is excavated with a Model 9-W Bucyrus-Monighan electric-powered walking dragline, which is equipped with a 165-ft. boom and mounts a 10-cu. yd. bucket. This machine was set up and placed in operation long before raw material was actually required in order to dig a half-mile-long barge canal into the property from the Intercoastal Waterway. Used initially as a means of floating the screening plant into the digging area, this canal now provides access and docking facilities for incoming fuel oil barges.

Initially some difficulty was experienced in developing a pond wide enough and deep enough to keep



Plan and side elevation of the floating screening plant. Raw shell is fed by means of a walking dragline into the hopper at the extreme left, and is delivered at the desired calcium-carbonate content onto one of the belt conveyors at the far right. Waste material, consisting mainly of sand, is pumped ashore.

spoil run-back from hampering operations. This has been solved temporarily by leaving a dike of undisturbed earth on the spoil side of the pond, but this practice will be abandoned when the necessary pond width has been achieved.

When the present final stages of development work are completed, it will be the practice to cut a strip 40 to 50 ft. wide and approximately 2,000 ft. long on each pass, digging to a depth of about 30 ft. below the water surface, or 40 to 50 ft. below the ground surface. The general practice is to take the shell just as far down as it may be found in sufficient quantity. The cut is made across the ridge in an approximately east-and-west direction, with the walking dragline maneuvering on adjacent unexcavated land as the shell is dug.

It was the original intention to excavate the shell and feed the floating screening plant simultaneously, but early experience indicated that it would be necessary to give the shell more opportunity to drain. In consequence the screening plant is now operated only one shift a day, during which time the dragline feeds to it the shell which has been dug and stockpiled during the other two shifts.

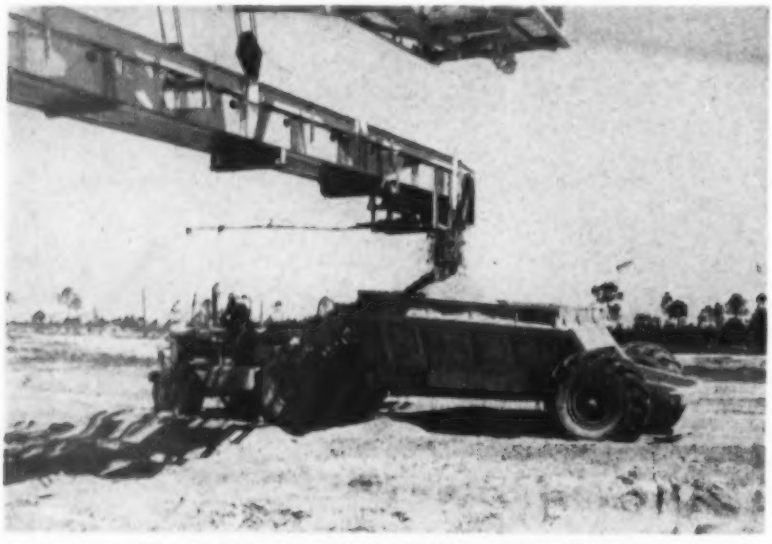
On the day shift the screening plant, maneuvering by means of cables and winches, works in close to the stockpile of material accumulated the previous evening. The walking dragline feeds the mixture of shell and sand into a sizable receiving hopper mounted on the bow deck of the barge, this operation proceeding throughout the day at a rate of about 600 cu. yd. of total feed per hr. It should be noted, as an indication of the sand-shell ratio of the deposit, that on the average only about one-third of the volume of material fed to the screening plant comes out as raw shell suitable for making cement.

The screening plant consists of two parallel circuits incorporating the necessary feeders, screens, sprays, flumes, belt conveyors, and other facilities required to deliver a plus 20-mesh shell product of the required calcium-carbonate content. Each circuit incorporates a 5- by 14-ft. Type F-900 Tyler Ty-Rock double-deck screen as a scalping unit and six 4- by 12-ft. Type F-600 Ty-Rock single-deck screens for finishing. The scalping screens have 1½- and ⅜-in. openings, but all the sizing units are fitted with 20-mesh cloth.

Water for washing the product and for operating the flumes and pumping the discharge ashore is provided by a Morris pump which has a capacity of 14,000 g.p.m. This unit is driven by a 700-hp. synchronous motor, while the 18-in. Type M sand pump of the same make has a 500-hp. drive motor. The latter unit pumps the waste material (primarily sand) through 18-in. diameter steel and rubber pipe lines supported by trussed booms which extend from either side of the barge. The sand pump has a capacity of 12,000 g.p.m. at 10 percent solids, and it is equipped with a variable-speed drive.

The principal product of the screening plant is designated as "high shell", ranging from 90 to 94 percent calcium carbonate. Control is maintained by reducing or increasing the volume of water which passes through the high-pressure sprays mounted above the 20-mesh screens, these variations being made in accordance with regular tests of the material after it leaves the screens.

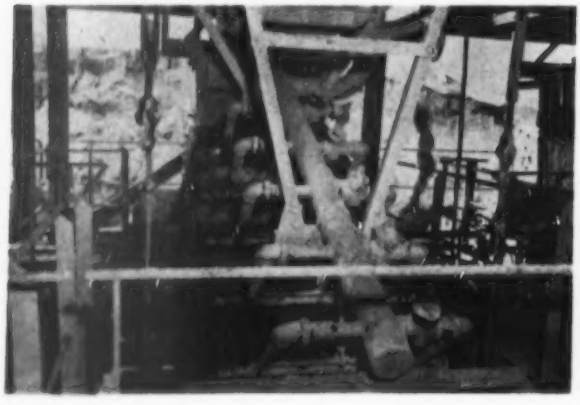
The screening plant is also periodically operated in such a way as to produce a "low shell" product, which is used as a means of varying the silica content of the raw mill feed. The term "low shell" is applied to material which has a calcium-carbonate content of 76 to 80 percent.



A diesel-powered tractor-trailer bottom-dump unit being loaded with finished shell at the stackout conveyor of the barge.

Below, left: One of 12 similar 4- by 12-ft. single-deck finishing screens on the screening plant, used to produce plus 20-mesh shell.

Below, right: One of two large pumps on the floating screening plant, which is used for pumping waste material.



It is produced by cutting off some water sprays, except at the scalping screens, so that a larger percentage of silica can pass over the sizing screens along with the shell. Since only a relatively small quantity of "low shell" is required for purposes of silica control, the screening plant produces this material only on such occasions as the supply drops below a safe margin. Under ordinary conditions, a day's production of "low shell" is sufficient to operate the mill for about a week.

Thirty-six-in. wide belt conveyors, supported by the same booms which carry the discharge pipes for waste material, deliver the washed shell to either side of the barge. Thus, no matter which way the plant is heading, waste material can always be discharged south of the cut while the end product is loaded on the north side. The booms are of such length that the points of discharge are approximately 155 ft. from the centerline of the barge. The outer 57-ft. section of each conveyor is hinged so that the discharge points may be brought reasonably close to the truck bodies used in hauling the shell.

Shell is hauled to the plant storage building by means of three Caterpillar DW-20 diesel-powered bottom-dump units. These tractor-drawn semi-trailer bodies haul 22 tons of "high shell" per trip, and about 24 tons of "low shell". The haul from the site of the present digging operations to the plant storage building averages about half a mile. A good day's haul may total 100 truckloads of "high shell". Shell operations require a 10-man crew on the day shift, when the floating screening plant is running, as compared with just an operator and an oiler for the walking dragline on the other two shifts.

Materials Storage A single large building 96 ft. wide by 441 ft. long serves the plant as a storage point for both grades of shell, for various other raw materials such as staurolite residue (source of Al_2O_3), slag (source of Fe_2O_3), silica and gypsum, for dried shell used in manufacturing masonry cement, and for clinkers. Two 10-ton overhead Bedford bridge cranes, mounting 3-cu. yd. clamshell buckets, serve to distribute both in-bound and out-bound materials

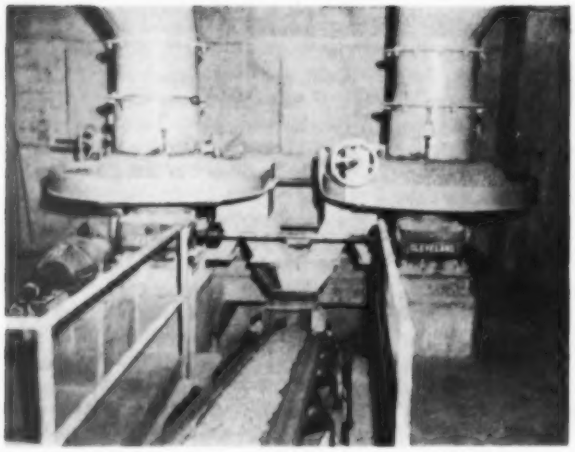
Truck loads of shell from the screening plant are discharged over a roadway hopper which has two short belt conveyors on either side of a center partition. These feed the shell onto a 30-in. by 350-ft. belt conveyor which elevates the material, carries it across the plant rail sidings, and discharges it in the raw material section of the storage building. Approximately 20,000 tons of shell can be accommodated under roof, and space is available adjacent to the building for open storage of an almost unlimited quantity by means of bulldozers. Other raw materials come into the property by rail and are transferred to the storage building by means of a track hopper and a separate conveyor system. The staurolite, a silicate of iron and aluminum, is a residue byproduct of ilmenite mining operations at Starke, Fla., while the slag, which has a high Fe_2O_3 content, comes from the Copper Hill, Tenn., operations of the Tennessee Copper Company. These materials, as well as gypsum, are stored in 1,000-ton capacity, open-top, poured-concrete bins located inside the storage building.

Other open-top concrete bins extend almost the entire length of the storage building on the side adjacent to the raw- and finish-grinding mill to serve as live storage for the various materials. There are "high shell" and "low shell" bins, each with a capacity of about 60 tons, for each of the three raw mills, as well as separate bins holding about 95 tons of slag and a little more than that amount of staurolite residue.

Similarly, at the opposite end of the storage building there are separate clinker, gypsum, and dried-shell bins serving each of the three finish-grinding mills. Each clinker bin holds the equivalent of about 1,200 bbl. of material, while the gypsum units

A single large storage building, equipped with two bridge-type cranes, is used for storage of raw materials (raw shell, gypsum, staurolite, slag, and dry shell) and clinker.

Another outstanding view of the raw and finish-grinding facilities. The units in the foreground, including the 10- by 15-ft. ball mills and the bowl-rake classifiers, are used for raw grinding. The ball mills in the rear are for finish grinding.



An accurately blended mixture of "high shell" and "low shell" is fed to each ball mill by means of separate, variable-speed table feeders.

For raw grinding this 12- by 38- by 20-ft. bowl-rake classifier is operated in closed circuit with a ball mill.

hold approximately 110 tons each and the dried-shell units about 100 tons each. Used in the manufacture of mortar cement, dried shell is prepared by feeding quarry-run material from the storage building to a rotary dryer circuit which will be described later. From the standpoint of storage facilities, the dried shell circuit includes a 52-ton bin from which the dryer is fed, a 15,000-ton bin for accumulating the dried product, and the separate 100-ton bins already referred to for feeding the three finish-grinding circuits. All of these bins are located inside the storage building and are served by the 10-ton overhead cranes which span the structure.

Raw Grinding The raw mills consist of three identical F. L. Smidth units 10 ft. in diameter by 15 ft. long and driven by 700-hp. General Electric synchronous motors. Each mill normally operates in closed circuit with a 12- by 38- by 20-ft. Dorr bowl-rake classifier, but provision has been made so that at need two of the mills can be operated in open circuit; if, for example, the Unidan mill, to which staurolite and slag additions are normally made, were out of service, these materials could be introduced at one of the regular mills in order to maintain production.

Each of the 15-ft. mills is fed a mixture of "high shell" and "low shell" by means of separate, variable-speed F. L. Smidth table feeders driven through Cleveland gear reducers. The feed rate of these units can be varied by means of the adjustable telescopic pipe and scrapers with which they are equipped, as well as by means of the individual m.-g. sets connected to each d.-c. drive motor.

In practice the rate of total feed is held at a fairly constant level of 21 to 25 t.p.h., while the individual rate of "high shell" and "low shell" feed is varied to obtain the desired silica. These adjustments are made in accordance with the silica found in slurry samples taken at intervals of approximately two hours. The feed averages about 86 per cent shell against 14 percent silica.

The table feeders discharge in pairs onto inclined belt conveyers which are the direct means of feeding the mills. Water is added to each mill circuit at a total rate varying from 400 to 600 g.p.m., this amount being accounted for by quantities introduced at the inlet and outlet points of the mill, and at sprays over the rakes which operate in circuit with the mill. Fischer-Porter automatic density controllers vary the amount of water entering each circuit to maintain a constant density of overflow. Thus all the mill operators must do is regulate the rate of shell feed, and the amount of water entering the circuit is adjusted automatically.

The mills operate at a speed of 19.1 r.p.m., and each is equipped with an F. L. Smidth mill level control which is hooked up with an indicating device. Each raw mill carries a total ball charge of about 108,000 lb. graduated as follows: 25,000 lb. of 2½-in. balls, 5,000 lb. of 2-in. balls, and 78,000 lb. of 1-in. balls. Information on ball charge replacement is still too limited to permit accurate conclusions, but there are indications that it ranges from 20 to 27 lb. per hr. per mill.

Each mill discharges into a sand wheel, and this in turn delivers the mixture of shell, sand, and water to the classifier in that mill circuit. Classifier overflow contains about 85 percent moisture and consists of 95

A 7-ft. 2-in. by 36-ft. two-compartment mill is used for the intimate blending of four components, including shell, silica, staurolite, and slag.

percent minus 200-mesh material. The coarser underflow material is returned to the mills for further grinding. The circulating load varies somewhat with the composition of the raw shell, but is believed to average about 200 percent.

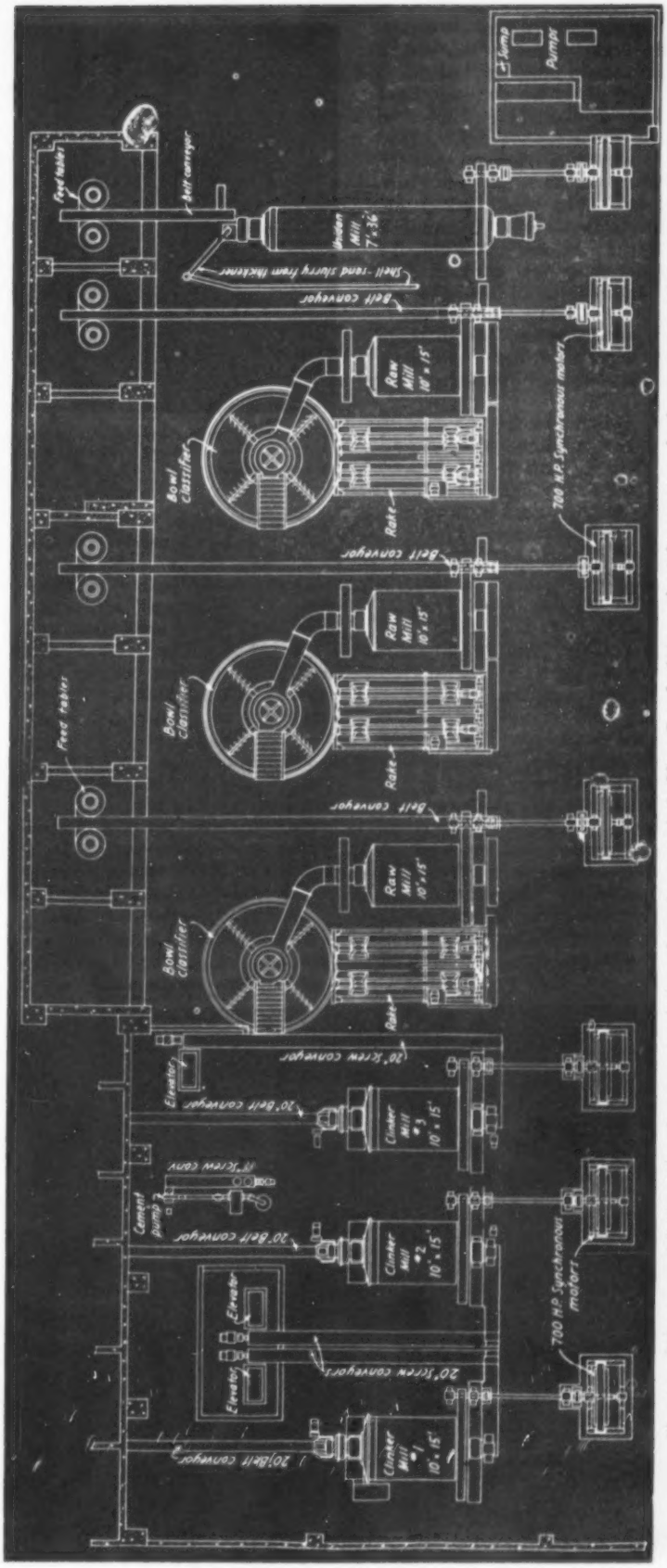
The overflow from all three grinding circuits flows by gravity to a common sump, and from this point an 8-in. Wilfley pump moves the material to a 185-ft. diameter Dorr thickener located outside the mill building. Since this unit contains about 4,000 tons of solid material at all times, it actually functions as a surge point as well as a thickener. For example, it has sufficient capacity to permit a 5-day-per-week raw mill operating schedule if this should be desired.

Input to the thickener is at the rate of about 1,300 g.p.m. of sand-shell mix containing 85 percent moisture. Moisture content of the underflow varies from 32 to 38 percent, while the overflow consists of clear water which is returned to the process room and re-used, along with additional makeup water. A 5-in. Wilfley pump returns the underflow to the raw mill section, where a portion of the material is re-fed to a 7-ft. 2-in. diameter by 36-ft. long F. L. Smidth two-compartment Unidan mill.

Since at this point the mixture of shell and silica is already down to the desired fineness, the Unidan mill is operated solely to reduce the staurolite residue and slag, and to bring about an intimate mixture of these materials with the shell slurry. The mill is driven at 20.6 r.p.m. by a 700-hp. General Electric synchronous motor, it is equipped with water-cooled, oil-lubricated bearings, and it has cylindrical screens bolted at the trunnions for the rejection of scrap iron. The feed end is charged with 10,800 lb. of 2½-in., 17,100 lb. of 2-in., and 9,000 lb. of 1-in. balls, while the discharge end has 52,300 lb. of 1-in. and 20,700 lb. of ¾-in. balls. Dry materials are fed to the Unidan mill in the same manner as dry shell is fed to the main raw grinding mills.

Only about 30 percent of the thickener underflow passes through the Unidan mill, this quantity being sufficient to obtain the desired amount of mixing with the other raw materials. The remainder of the slurry by-passes this mill, joining the mill product at the discharge end, from which point a 5-in. Wilfley pump picks up the entire flow and delivers it to a battery of blending tanks.

The raw mill department is exten-



Plan view of the raw- and finish-grinding departments, which are housed in a single building. Raw facilities at the right are set up for four-component single-stage grinding.

sively instrumented, and an exceptionally high degree of automatic control has been provided. Individual centralized panels for each mill have recording or indicating devices to show the following: speed of the feed tables; amperage readings on the mill, bowl, and rake; and water flow and density. The centralized panels also have switches for all the units in each circuit, including those for the individual m.-g. sets on each feed table, as well as all the interlock switches for a comprehensive alarm system. All feeders and belts throughout the department are progressively interlocked and are equipped with alarms.

Main switch gear for the grinding departments is housed in a separate room which extends the entire length of the mill floor. Clean air is supplied to this room by American C-11 multi-duty air filter units.

Slurry Blending The blending (or correcting) tanks are eight in number. They are of reinforced-concrete construction, have conical bottoms, and are 20 ft. in diameter by 50 ft. high. They are piped so that slurry may be pumped from any tank to any other tank, or to the slurry kiln feed tanks beyond the blending units. Although their primary function is to provide a final opportunity for correcting the composition of the slurry ahead of the kilns, these tanks also have an important function as storage units, and thus help to cushion the surges which are bound to occur at times in so complex a flow sheet.

The usual practice is to keep high-alumina and high-iron slurries in one or two of the tanks, and to use these materials as needed for making corrections in the remaining tanks. Material in the tanks is agitated by means of compressed air, which is introduced to the units consecutively by means of a rotating on-off timing device. Air for this purpose is provided by Ingersoll-Rand 450-c.f.m. stationary compressors, two of these machines being located near the correcting tanks, while a third identical unit is separately housed in the vicinity of the kiln feed tanks. These units are driven by 75-hp. motors. Piping is so arranged that at need any one of the compressors can supply all of the various points at which air is used for agitation.

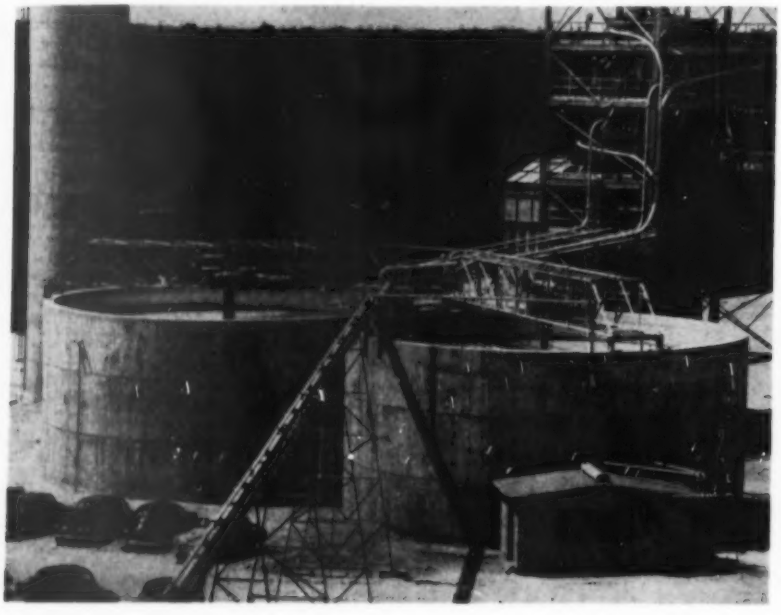
A 3-in. pump driven by a 40-hp. induction motor transfers the slurry from the kiln feed tanks to the kilns.

Slurry is moved from one correction tank to another by means of 4-in. Wilfley pumps which are also used for transferring the final blend to the two kiln feed tanks. The latter are 26 ft. high, have an inside diameter of 55 ft., and have a capacity of about 5,500 bbl. each. They are equipped with Dorr air-rake agitating devices. The two units have three 3-in. Wilfley pumps for delivering slurry to the F. L. Smidth spiral scoop, single-type slurry feeders ahead of the kilns. The slurry, which at this point contains about 34 percent moisture, reaches the feeders in somewhat greater volume than the kilns require, the excess overflowing at the feeders and returning by gravity to the feed tanks. Height of the slurry in the feeders is determined by positioning the adjustable overflow partition. Each kiln is fed at the rate of about 12½ cu. ft. per min. Since considerable accuracy is necessary, the feeders are checked periodically by means of calibrated measuring pots.

Rotary Kilns The kilns were supplied by F. L. Smidth & Co., and they are 10 ft. 6 in. in inside diameter by 380 ft. long. The all-welded steel shells are 1 in. thick except at the supports, where the thickness runs 2¼ in. for a length of 6 ft. under each tire, and 1½ in. for a length of 8 ft. on either side. Each shell has 28 stiffener rings.

The floating-type tires on which the kilns turn have an inside diameter of 11 ft. 2 in., and they rest on 48-in. diameter water-cooled supporting rollers which have a face width of 28 in. Each kiln is supported on five reinforced-concrete piers of sufficient height to keep the entire installation, including the coolers, above grade. The units are equipped with Smidth ⅝-in. patented distorted chains for a length of 52 ft., and the discharge ends have segmental nose rings. The kiln hoods are movable, being supported on four wheels which engage rails located on the operating platform.

The kilns are fired with No. 6 Bunker C fuel oil, which is brought to the plant through the inland waterway in 3,500-bbl. barges loaded in Jacksonville. At the plant dock oil is pumped into two 600,000 gal. concrete storage tanks, and then subsequently is pumped as needed to a supply tank adjacent to the kiln building. There is a 250-hp. Superior boiler at the main storage tanks for heating the oil at this point, and two 100-hp. units (one for standby) at the kilns for supplying the three Whitlock tube-and-shell steam heat



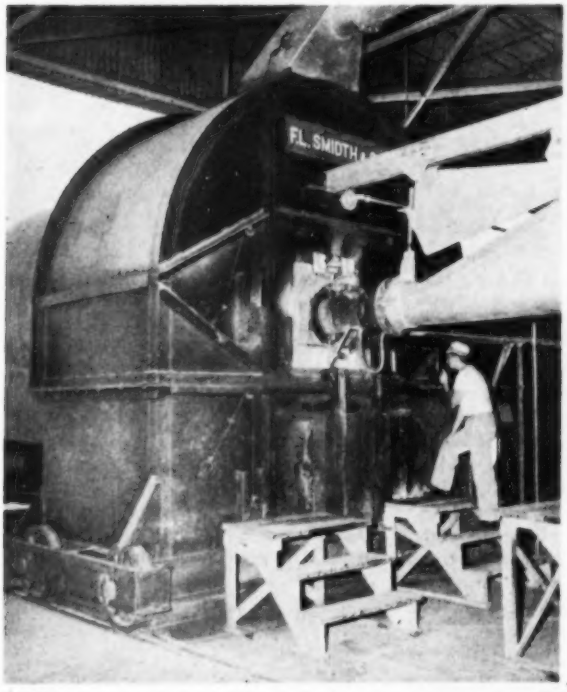
Slurry is fed to the kilns from these tanks, which are equipped with air-rake agitating devices.

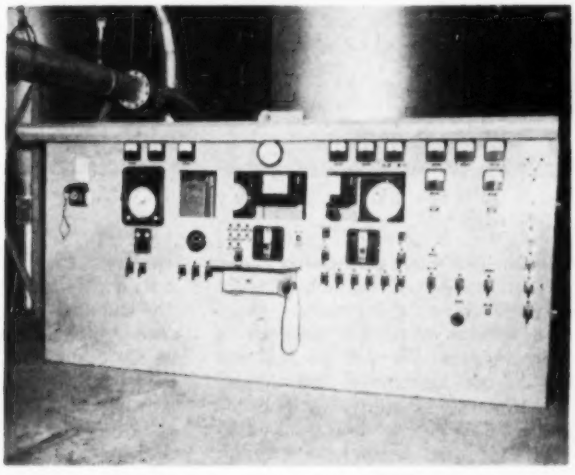
exchangers used to preheat the fuel to about 240 deg. F. The boilers are also fired with Bunker C fuel oil, and the installation includes Permutit water softeners. De Laval worm-type, rotary-screw pumps are used to pump the oil to the Enco No. 6 mechanical atomizer guns with which the kilns are fired. Fuel oil consumption ranges from 600 to 800 g.p.h. per kiln, or approximately 8½ gal. per bbl. of cement.

Kiln drives consist of 125-hp. General Electric adjustable-voltage, adjustable-speed d.-c. motors through Falk No. 12½ GRA reducers which have a reduction ratio of 104:1. Maximum speed of rotation is about 1.35 r.p.m., or 81 r.p.h. The average speed of operation, however, is closer to 65 r.p.h. to yield the 2,000-bbl. per day output at which each kiln is rated. Standby drives for use in the event of power failure consist of Hercules JXD 55-hp. gasoline engines and Falk speed reducers.

Draft for the burning operation is supplied by Smidth No. 480 induced-draft fans designed to handle a gas volume of 88,000 c.f.m. at 475 deg. F., and to develop a static pressure of 6 in. These units are driven by 200-hp. General Electric synchronous motors. The kilns exhaust through Western Precipitation type 9UG12, Size 35-5 Multiclone dust collectors. Recovered dust, amounting to about 100 bbl. per kiln per day, is re-fed to the kilns along with the slurry. Other Western Precipitation Multiclone collectors serve the Fuller grate coolers and the shell dryer circuit, which will be described later.

Each kiln has a separate centralized control panel on which are mounted the numerous indicating and recording devices now regarded as indispensable in order to maintain complete control of the complex operation of burning clinker. One of the most important instruments in the installation is a Cambridge gas analyzer by means of which oxygen is handled at ½ of 1 percent to 1 percent, CO_2 at 27 or 28 percent, and combustibles at 0 to ½ of 1 percent. The analysis of the O_2-CO_2 combination is recorded on the con-

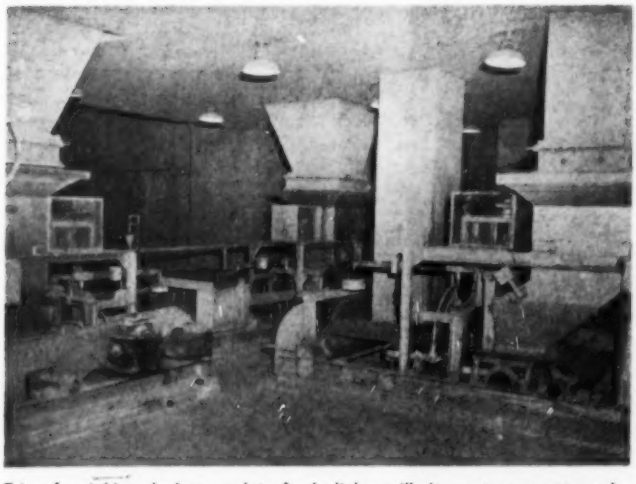


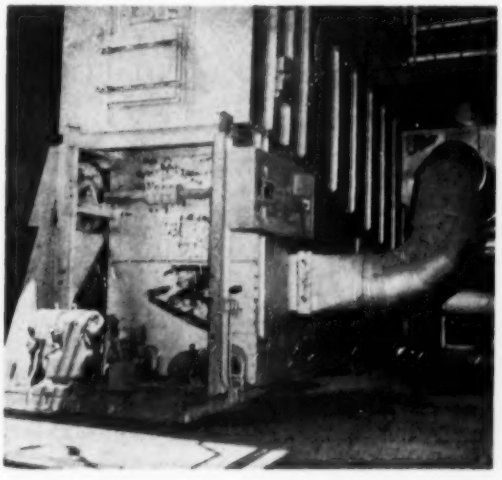


Above: Each kiln has a separate centralized control panel.

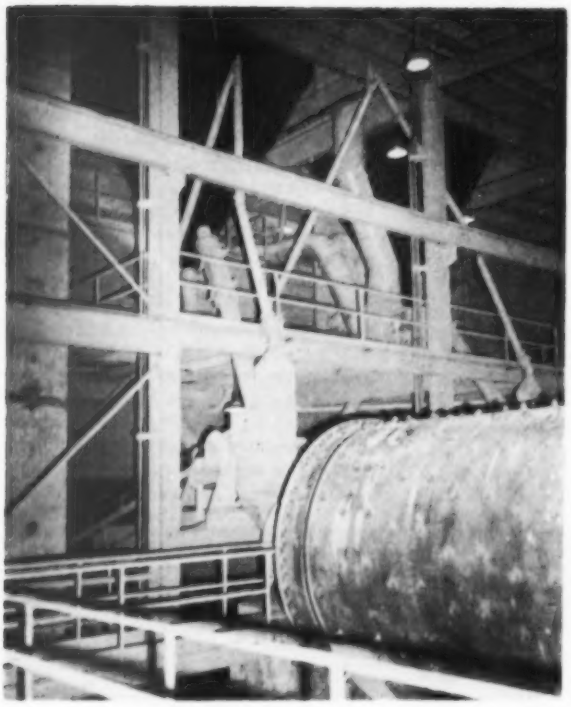
Left: The kiln hoods are movable, being supported on rails. Note the monorail for removing the burner pipe when necessary.

Below: The rear of the 6- by 33-ft. inclined grate-type cooler, showing the ducts leading from the fan and the drive for the grates.

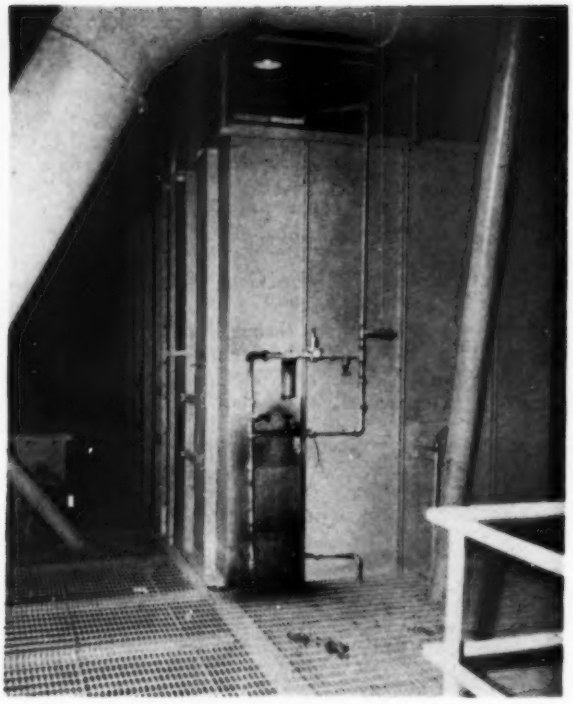




Trio of weighing devices used to feed clinker mills in mortar cement production: left, gypsum; center, dry shell; and right, portland cement clinker.



Each 10- by 15-ft. clinker mill operates in closed circuit with a 16-ft. air separator.



Dust from the clinker grinding department is collected in this single 25-ft. long automatic bag-type dust arrester.

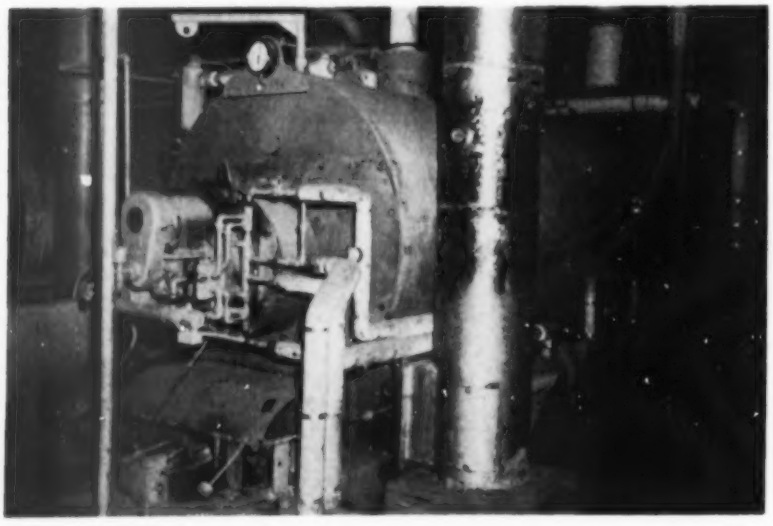
trol panel for each kiln. Other more conventional provisions include indicating or recording devices for showing draft and temperature at various critical points, as well as fuel oil temperature, kiln speed, and voltage and amperage readings. Inlet temperatures average around 2,700 deg. F., while outlet temperatures range from 400 to 500 deg. F.

Clinker drops from each kiln into a No. 633 Fuller inclined-grate cooler which measures 33 ft. 4 in. in length by 6 ft. in width. Each cooler is served by a New York Blower fan. The coolers deliver the clinker to a system of chain drag conveyors which finally discharge the material inside the storage building. Clinker storage capacity totals about 105,000 bbl. Handling and storage facilities for clinker, gypsum, and dry shell were described earlier.

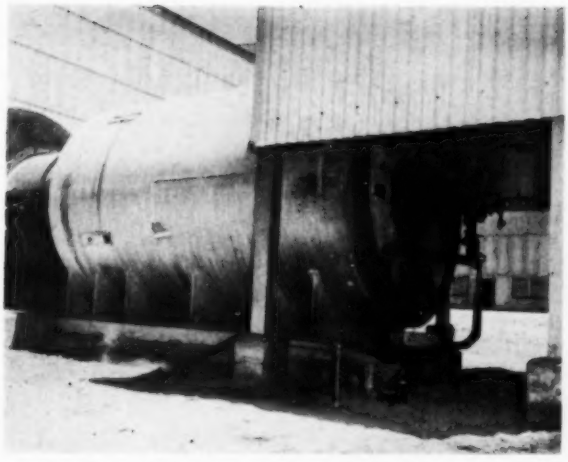
Shell Drying At this point in the flow sheet one more raw material (dried shell) enters the process. It is prepared in an entirely separate, non-continuous operation, and is used only in the grinding of masonry cement.

Quarry-run shell, containing approximately 10 per cent moisture, is picked up by the bridge cranes and placed in a 52-ton supply hopper located in the storage building. From the hopper a Smidth table feeder delivers the shell to a 7- by 80-ft. rotary dryer of the same make. This unit, which has a capacity range of 12 to 15 t.p.h., is quadranted for the first 50 ft. to achieve the maximum tumbling action as the shell passes through.

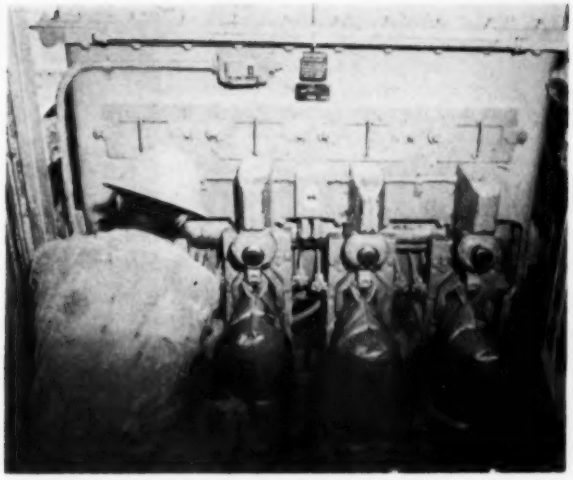
Heat for the drying operation is supplied by an Agitair Type R, Size 8, horizontal direct-fired hot-gas generator. This unit is 6 ft. 10 in. in diameter by 14 ft. 8 in. long, and it is fired with Bunker C fuel oil by means of a Ray Type AG-11, No. 9 burner unit. Temperatures in the drying cycle range from 1,100 deg. F. at the inlet end of the dryer to approximately 260 deg. F. at the outlet end. Dried shell, which has a moisture content of 1 to 2 percent as it leaves the drying circuit, is conveyed back to the storage building and discharged into an open-top concrete hopper holding approximately 15,000 tons. Since the amount of dried shell required is relatively small, it is the practice to operate the



A 100-hp. steam generator used in preheating fuel oil for the burning operation.



Heat for drying shell used in mortar cement production is supplied by this oil-fired generator.



One of three four-spout bagging machines installed in the packhouse.

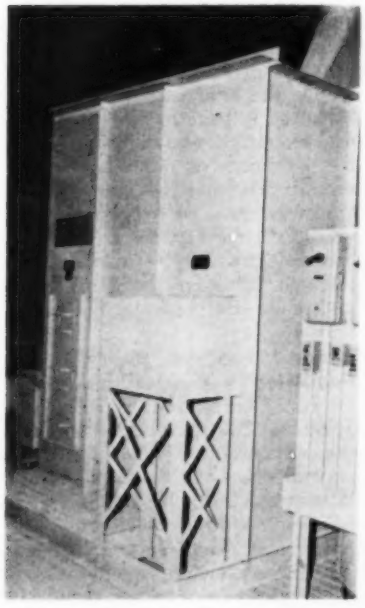
dryer for two or three consecutive days, and then to shut it down for several weeks until it is necessary to replenish the supply.

Clinker Grinding Except that they are installed for dry grinding instead of wet, the three mills used for grinding clinker are identical with the mills in the raw-grinding department. They carry a charge of about 90,000 lb. graduated from ¾-in. to 3½-in. steel balls.

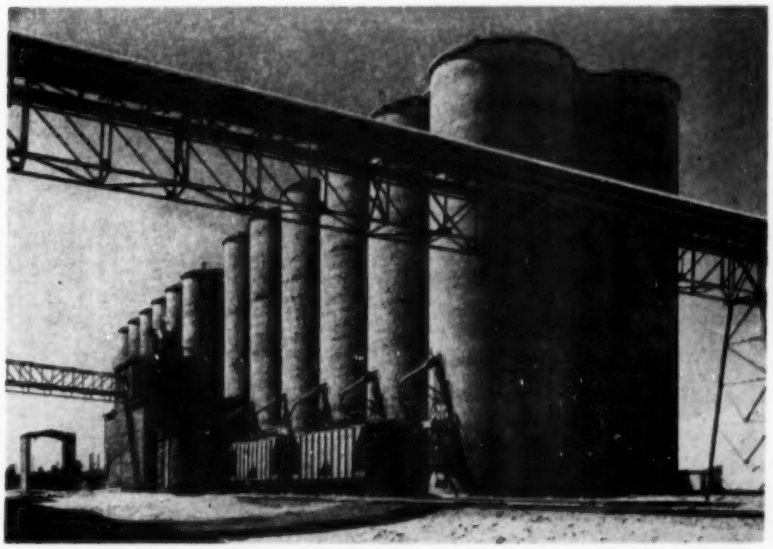
Clinker, gypsum, and (when required) dried shell are fed to the mills by means of Schaffer Poidometers. The units used for clinker feeding are 30 in. wide by 4 ft. 6 in. long and have a feed range of 10,000 to 50,000 lb. per hr. Poidometers used for gypsum and dried shell are only 20 in. wide, and they have a feed range of 400 to 2,000 lb. per hr. in the case of gypsum, and 5,000 to 25,000 lb. per hr. in the case of shell. Each unit is equipped with its own m.-g. for the purpose of varying speed.

The mills themselves are equipped with electric mill-level controls and temperature recorders at the outlet ends, and they grind in closed circuit with 16-ft. Sturtevant air separators. The specially-designed cement mill separators are rated at 100 to 125 bbl. per hr. of Type 1 portland cement ground to a fineness of 1,600 to 1,700 Wagner S. A. Screw conveyors receive the product of the mills and deliver it to bucket elevators, which in turn feed the air separators. Coarse material, the size of which is determined by the number of rejector blades carried in the separators, is returned to the mills by gravity for further grinding. It is believed that each of the circuits can readily accommodate a circulating load up to 600 percent. Actual output of each mill runs about 100 bbl. of Type 1 cement per hr.

An exceptional job of dust control has been accomplished in the clinker grinding department with a single 25-ft. long 5-compartment Norblo automatic bag-type dust arrester and auxiliary equipment. Draft is supplied by a No. 60 Norblo Type HS fan, and each compartment is fitted with 78 6-in. by 8-ft. 3-in. cotton bags. The 390 bags which comprise



Dust control is achieved in the packhouse by means of five dust filter-type collectors, one of which is shown here.



A view of the bulk storage and loading-out facilities. The 24 concrete silos have a capacity of 200,000 bbl.

the entire installation have a free cloth area of 4,680 sq. ft. Auxiliary equipment includes an electric timing device which automatically cleans the bags and thus assures continuous operation. The collector vents the down spouts from the various Poidometers, the inlets and outlets to each of the three grinding mills, and such other critical dust-generating points as the screw conveyors and bucket elevators.

Recovered dust is combined with the product of the mills in a screw conveyor just ahead of the conveying system which moves cement to the storage silos. This Fuller-Kinyon installation consists of a 7-in. Type H-2 pump with solenoid air valve feed control and a C-250 single-stage rotary air compressor. It has a peak capacity of 350 bbl. per hr. at the maximum distance of 551 ft.

Storage and Packhouse The storage system for finished cement consists of 24 concrete silos which have a total capacity of 200,000 bbl. These measure 13 ft. 9 in. in diameter by 82 ft. high, and are arranged in two double-row groups of 12 units each, with a bulk loading station and track scale on one side, and the packhouse on the opposite side. Housed in a pit between the two groups is the Fuller-Kinyon system which is used to circulate cement from one silo to another, to convey it from the silos to the packhouse, and to supply the bulk loading station. This installation comprises two 9-in. Type H pumps and two C-250 single-stage rotary compressors. It is supplied by means of screw conveyors located under the silos, from which the cement is withdrawn by rotary valves.

In the packhouse proper there are three 4-spout 150-FC St. Regis bagging machines, two of which are normally used for Type 1 cement, while the third is used for masonry cement. Bags are stored on the floor above, and are transported to the machines by means of dumb waiters as needed. There are screens ahead of the machines for the purpose of removing lumps of cement or foreign matter, and each unit has an independent circulating supply system consisting of Fuller-Huron Airslides, screw conveyors, and a bucket elevator. The Airslides, which are the immediate means of withdrawing cement from the packhouse supply bins, are 12-in. wide units of the open-trough type, and they range in length from 2 ft. 6 in. to 10 ft. 3 in. The six sections of conveyor are supplied with low-pressure air by two positive-pressure blowers.

Laboratory technicians constantly check cement and raw materials samples.

Exceptional dust control in the packhouse and at the bulk loading stations is achieved by means of five Sly dust filters which vent the packers, the packer bins and spill hoppers, the screens, the screw conveyors, and the bucket elevators. These units vary in length from 6 ft. to 14 ft., and have a total net cloth area of over 18,000 sq. ft.

At the present time about 40 percent of the total output of the plant is packed in bags by working two 3-man bagging crews. Rail sidings flank the packhouse on either side so that several cars may be loaded simultaneously, and there is also provision for loading trucks if this should become necessary. Including the foremen, 14 men are employed in packhouse and bulk loading operations.

Other Facilities Major plant buildings other than those already referred to include an attractive air-conditioned concrete masonry structure which houses the general offices and a well-equipped laboratory, and a 70- by 140-ft. shop building with store room, locker room, and change house adjoining. The shops are equipped to make virtually any routine repair required to assure the maximum continuity of plant operations.

The property has its own sewerage

This well equipped machine shop can handle virtually all types of routine repair.

W. J. Klein, assistant plant manager of Lehigh's Bunnell plant.

system, and there are two 70-ft. deep wells for supplying drinking water, cooling water for the air compressors, and water used in the laboratory. Process water, and water for general cooking and fire protection purposes is pumped from the quarry.

Consumption of electrical energy is at the rate of about 100,000 kw.-hr. per day—about enough to take care of a modern city of 30,000 people. Electricity is supplied by the Florida Power & Light Company from a substation. It comes into the plant at 66,000 volts, but is stepped down to 4,000 volts before it is fed to the various substations on the property.

For general emergency power there is a General Motors 300-kv.-a. 8-cylinder diesel generator set, and there are stand-by gasoline-driven pumps for fire water and process water. The floating screening plant has a 4,160-volt portable cable for normal power requirements, but here, too, there is a gasoline-powered d.-c. generator to supply the light circuits and drive the winches on an emergency basis.

Mention was made earlier of the outstanding safety engineering evident in every department of the Bunnell plant. Catwalks, access platforms, and stairways throughout the plant are exceptionally wide and have been provided in all cases with handrails that are both comfortable and sturdy. Ample headroom seems to have been provided in all areas which must regularly be traversed by employees, and no reasonable effort or expense has been spared in making and installing adequate guards for moving machinery.

Elevators have been provided at strategic points throughout the plant to facilitate the movement of materials and for the convenience of employees. There are freight elevators at the rotary kilns for handling lining brick and at the packhouse for storing and handling bags, and man elevators give access to the top of the silos and to the top of the slurry blending tanks.

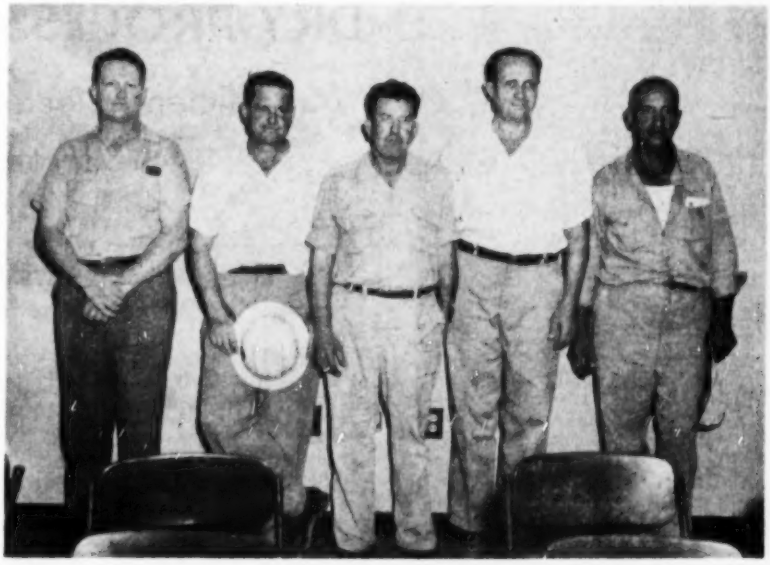
Credits The Bunnell plant was designed and built under the engineering supervision of F. L. Smidth & Co. The screening plant, with the exception of the hull, was designed by Robins Engineers. Walsh Construction Company and Duval Engineering & Contracting Co. were construction engineers and builders for the project, and General Electric was responsible for the entire electrical design. Consolidated Chimney Company built the concrete stack which serves the kilns, and the Preload Company built the prestressed concrete tanks for fuel oil storage.

Personnel About 150 men are employed in the round-the-clock operations of Lehigh's new plant. Henry Burks is plant manager, and his assistant is William J. Klein. Other key supervisory personnel include H. M. Burt, chemical engineer, W. R. Geiling, chief clerk, E. C. Golein, assistant chemist, R. D. Shatz, maintenance foreman, W. Robinson, chief electrician, John Kunkle, packhouse foreman, and W. O. Branharn, quarry foreman,

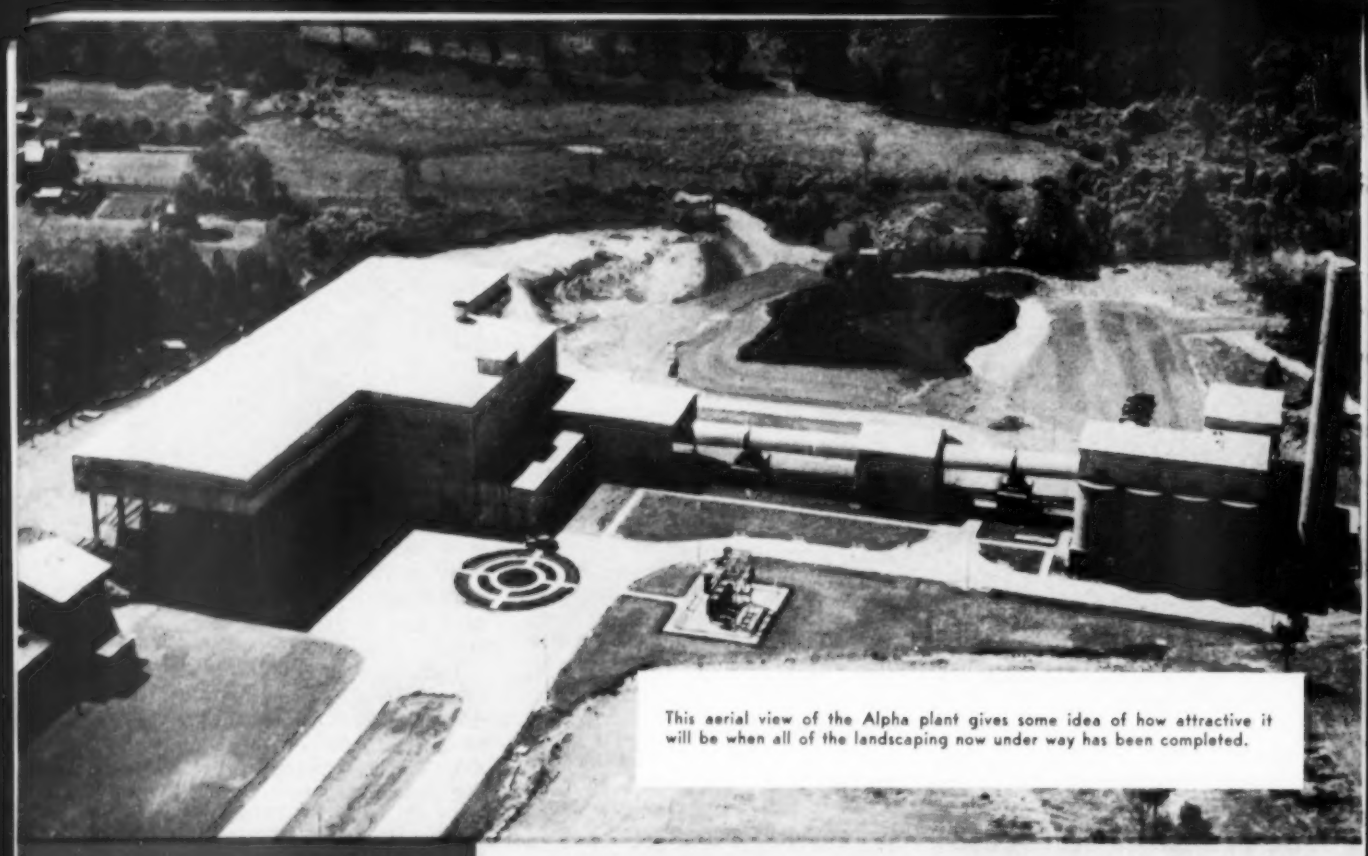
Left to right: W. R. Geiling, chief clerk; H. M. Burt, chemical engineer; and E. G. Golein, assistant chemist.

John Green, Ray Lehr, H. Kunzman, and E. Dietch are shift foremen.

Today Lehigh operates a total of 15 plants engaged in the manufacture of portland cement. In addition to the facilities described here, the company has important properties at the following points: Birmingham, Ala.; Oglesby, Ill.; Mitchell, Ind.; Mason City, Iowa; Iola, Kan.; Union Bridge, Md.; Alsen and Buffalo, N. Y.; Cleveland, Ohio; Fogelsville, Ormrod and Sandt's Eddy, Pa.; Fordwick, Va., and Metaline Falls, Wash. Joseph S. Young is president of the company, John C. Bowen is executive vice-president, Roy N. Young is vice-president and operating manager, C. G. Browning is vice-president and general sales manager, and R. O. Erdman is vice-president in charge of purchases.



Other supervisory personnel at the Bunnell plant include (left to right): John Greene, shift foreman; R. D. Shatz, maintenance foreman; W. Robinson, chief electrician; H. Kunzman, shift foreman; and W. O. Branharn, quarry foreman.



This aerial view of the Alpha plant gives some idea of how attractive it will be when all of the landscaping now under way has been completed.

Alpha's New Wet-Process

REPLACES OLD DRY-PROCESS OPERATION AT

Efficiency, economy, and appearance given primary consideration

★ ★ ★ ★ ★

By WALTER E. TRAUFFER

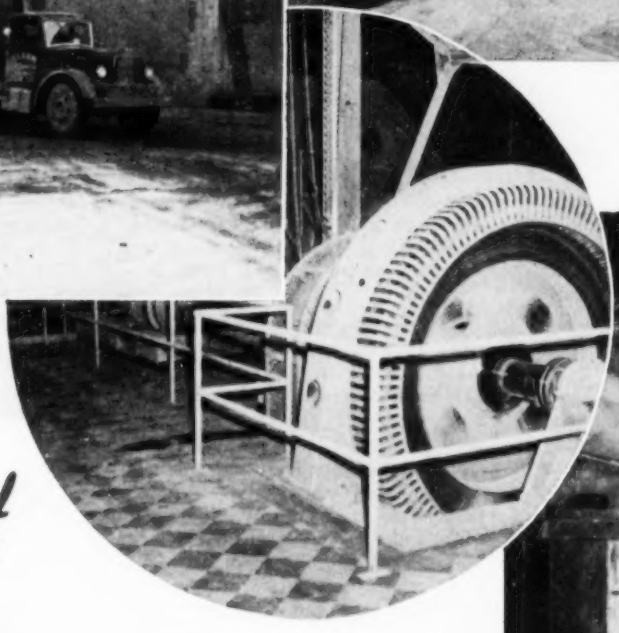
another ON THE SPOT report

THE most important step yet taken by the Alpha Portland Cement Company in its extensive and long-term post-war improvement program was the replacement of its old two-kiln dry-process plant at Jamesville, N. Y., by a new one-kiln wet-process plant of greater capacity. The old plant was over 40 years old and had been improved from time to time, but under present-day high prices of labor, fuel, and supplies and the handicaps of low production its operation was no longer feasible.

The new plant was designed for simplicity, efficiency, economy, and minimum labor requirement. No future expansion is immediately contemplated, but the design provides for any possible future demands. Its designed capacity, which is being exceeded, is 2,200 bbl. daily or 800,000 bbl. yearly, and compares with

A truck discharging a load to raw material storage. The overhead traveling crane is ready to rehandle it.

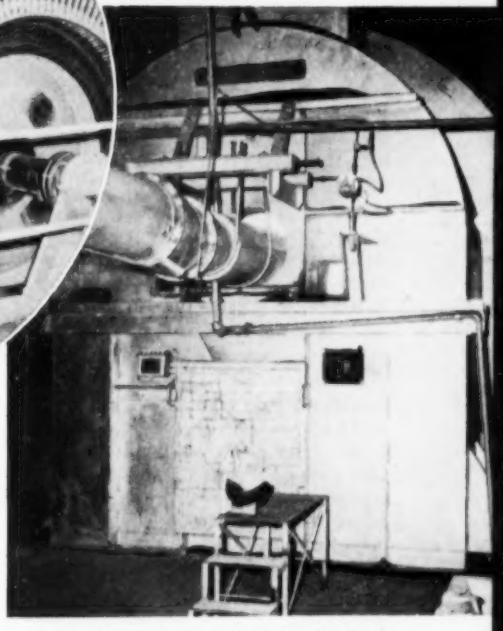
This view of the plant shows the two-level design, which provides for basement space.



Plant

JAMESVILLE, NEW YORK

The 8- by 40-ft. 3-compartment raw mill with its 1,000-hp. motor and magnetic clutch.

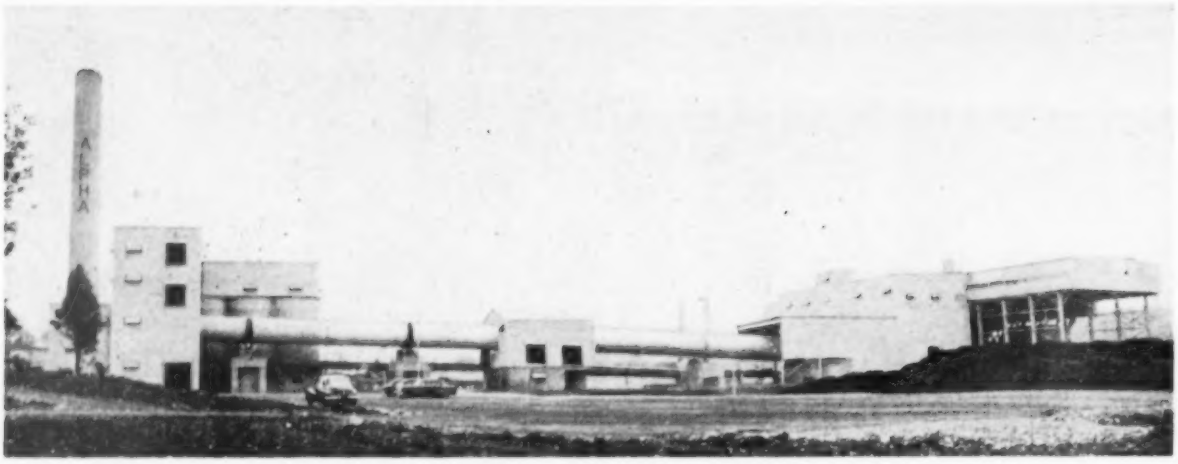


The hood and burner of the 11- by 375-ft. rotary kiln.

★ ★ ★ ★ ★

1,200 bbl. and 430,000 bbl. for the old plant. The selection of the wet process was influenced by the fact that the limestone from an outside source is wet screened and has a high moisture content, that the shale used is also quite wet, and that both materials would have to be dried before grinding. Both shale and stone were formerly received in railroad cars, but a new shale quarry was opened nearer the plant and truck haulage was inaugurated, eliminating the freezing of these materials in transit during cold weather.

The original dry-process plant at this location was built by the Thomas Millen Company, a local group whose members saw the possibilities of using screenings from the Solvay limestone quarry. Construction was started in 1909, and the plant was in operation in September, 1911. At that time its capacity was 800 bbl. daily. In July, 1917, this plant was purchased by the Alpha Portland Cement Company. Since then the only major changes made were the installation of unit coal mills on the kilns, a new raw mill and raw-material blending bins, and closed-circuiting in both raw- and finish-grinding departments. With this equipment and its better operating methods, Alpha was able to increase the capacity of this plant to 1,200 bbl. daily.



A general view of the plant, with the stack and raw silos at the left, the mill and storage buildings at the right. Note the storage rooms in the kiln piers.

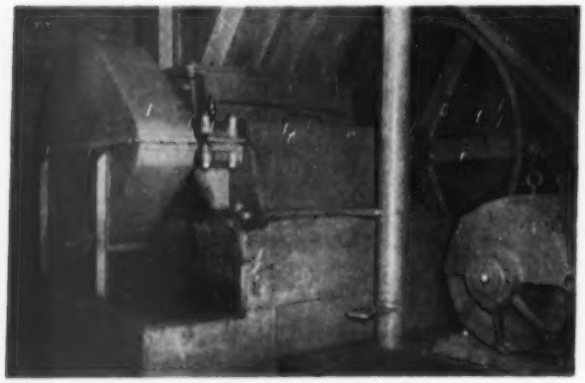
Construction of the new plant was started on March 11, 1951. It went into full operation on October 13, 1952, at which time the old plant was shut down. The only parts of the old plant being used are the cement storage silos and stockhouse, the packhouses, and several auxiliary buildings. Still under construction are a bulk-cement loading setup, four additional cement silos, and an extension to the crane storage building. It is expected that a new plant office building will soon be built.

The construction of the plant was slowed by about six months due to delays in procurement of steel, heavy machinery, and electrical equipment. Actually 20 months elapsed from the time ground was broken until the plant was started in operation. Some of the reinforcing steel used actually was shipped in from the West Coast, and some of the cars were delayed in transit by the Kansas floods of 1951. Concrete was poured during the entire winter of 1951-2 by using heated aggregates, protected curing, etc.

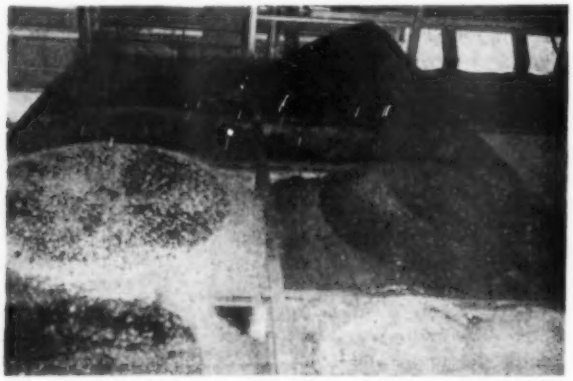
The most serious construction problem, other than those mentioned above, was the necessity for moving about 100,000 cu. yd. of material to level off the sloping terrain for the new plant. This was done by contract. The area is a glacial deposit with boulders up to 12 ft. in diameter, which presented a serious excavating problem.

There are many interesting and some unusual features in the design of this plant. In the crane storage building, for example, the mill feed bins run across the storage in line with the mills, thus requiring only one feed conveyor for each mill. Under the conveyor floor is a repair parts storage. The raw and finish mills and the discharge end of the kiln are in one room. This arrangement makes it possible for both the burner and the miller to see all parts of both departments and it keeps the mill room warm in winter. Ventilators around the top of the building help keep it cool in summer. All equipment in the mill building is set high enough so that a truck can be driven into the ground floor to bring in grinding balls, lining brick, repair parts, etc. The slurry silos are elevated, with the laboratory and other rooms below them, for reasons described elsewhere. This arrangement keeps those departments warm in winter and cool in summer. There is an oil heater for use in winter. The top floor above the slurry tanks is connected with the kiln feed end building, and it is thus also kept warm. Actually there is not a really cold spot in this plant. The kiln is housed only at the feed and discharge ends and at the drive. An auxiliary oil heater on the ground floor of the mill building keeps this department warm in winter in case of kiln shutdown and also prevents freezing of the materials in the mill feed bins. The concrete kiln piers are all arched, and these spaces are used for store rooms, repair shops, etc.

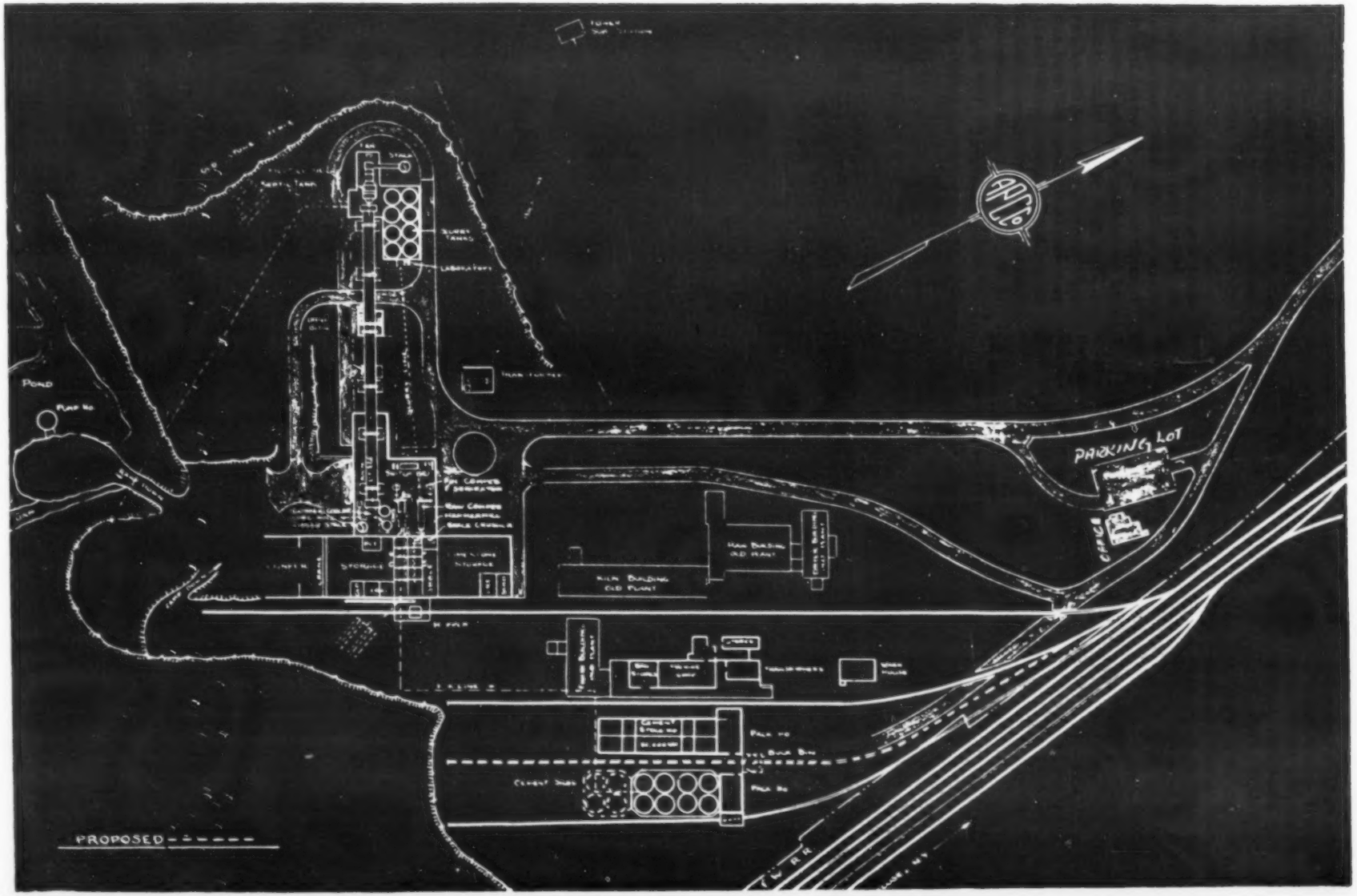
The plant itself has the practical beauty of a well-designed industrial operation, and every effort is also being made to beautify its surroundings. A local landscaping firm is seeding the grounds and many trees, shrubs, and flower beds are being planted. Over 10,000 cu. yd. of top soil has been brought in. All storage and other areas about this plant are hard-surfaced, and the main roads are concrete. The plant is completely



The 24- by 20-in. single-roll shale crusher.



Compartments in the covered storage building for limestone, shale, iron ore, clinker, etc.



Plan of Plant No. 1 of the Alpha Portland Cement Company at Jamesville, N.Y., showing existing installations and proposed additional silos.

floodlighted for night operation, and the entrance and service roads all have street lights. The results are so good that this plant may become known locally as Alpha Park.

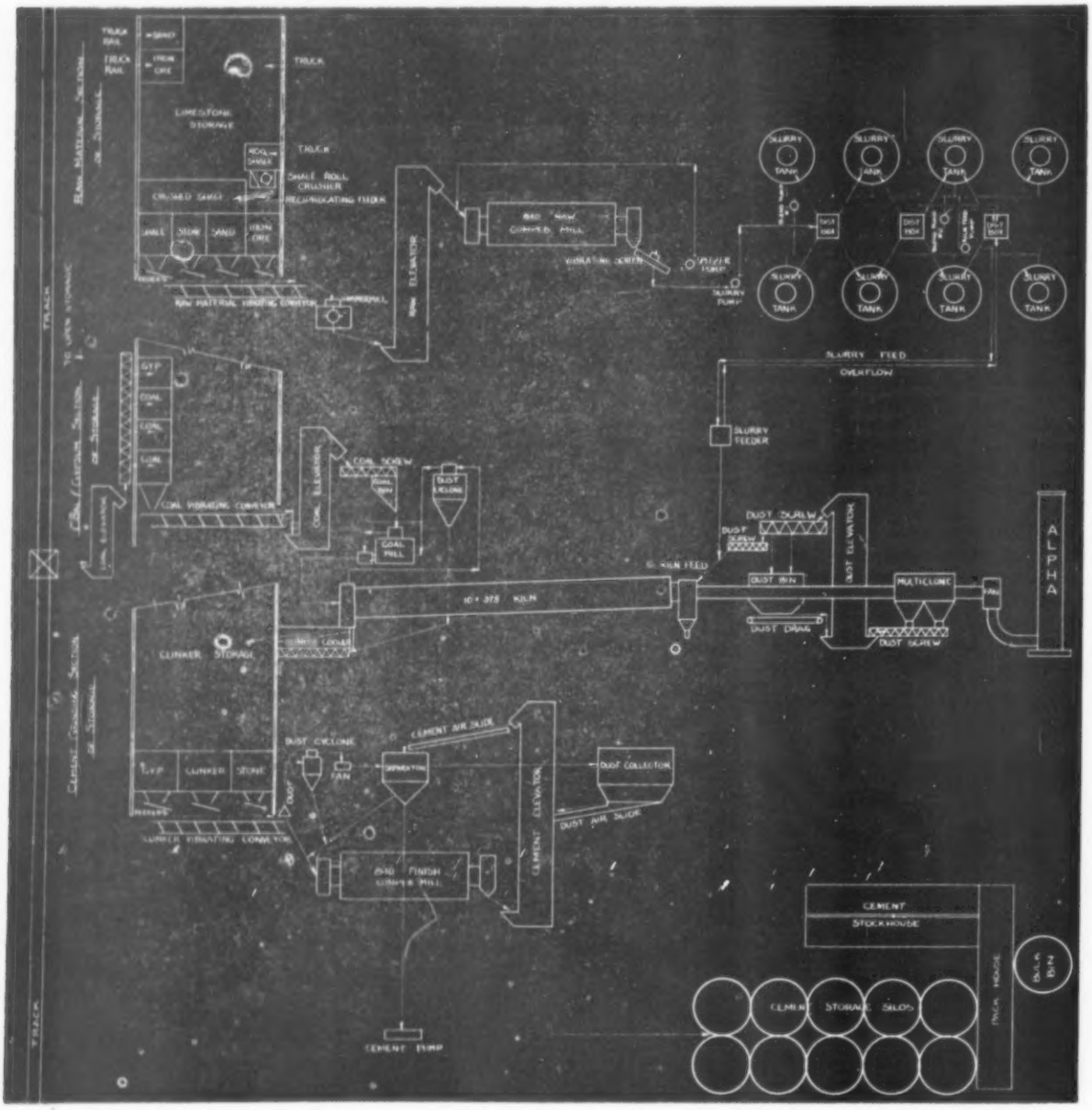
Every effort has been made to make this plant attractive, clean, safe, and comfortable to work in. The attention to appearance inside and out is described elsewhere, as is also the complete dust-collecting system and the provisions for keeping workers warm in winter. Every possible safety precaution is also taken, with every potential danger point well guarded. Electric water coolers are located at strategic points, and there are washrooms in addition to the main locker and shower rooms.

Raw Materials The limestone used in this plant comes from the nearby quarry of the Solvay Process Division of the Allied Chemical & Dye Corporation. This is a very uniform stone containing over 90 percent $CaCO_3$. Shale from the company's own quarry runs high in iron and alumina and low in lime but is also very uniform. Both materials are delivered in 20-ton rear-dump trucks on a contract basis.

The open shale quarry is 3½ miles southeast of the plant in a deposit of the Chittenango and Cardiff shales. The face is now 60 ft. high but will approach 90 ft. as development proceeds. Wagon drills are used, and both drilling and blasting are kept six months ahead of plant needs. The shale is loaded into trucks by a ¾-cu. yd. P&H diesel shovel.

The trucks dump the shale and stone into pits at one side of the 80- by 280-ft. covered storage building. Silica sand from local sources is also received by truck when required for the manufacture of Type II cement. A P&H 80-ft. span overhead traveling crane with a 3-cu. yd. Blaw-Knox clamshell bucket feeds the stone and sand direct to storage compartments. Iron ore, also used for manufacture of Type II cement, is received by rail and is loaded direct from cars to

Flow sheet of the Jamesville plant—from the raw material section to the packhouse.



storage by a Barber-Greene unloader. This building has storage space for 4,300 tons of limestone, 1,200 tons of raw shale, 1,200 tons of crushed shale, 600 tons of gypsum, 900 tons of coal, 500 tons of iron ore, 400 tons of sand, and upon completion of the extension now under way 45,000 bbl. of clinker.

The shale is taken from its pit by the overhead crane to a concrete hopper over a Pennsylvania "Armorweld" 24- by 40-in. single-roll crusher which is driven at 35 r.p.m. by a 75-hp. motor. This reduces it to minus 2-in. size at the rate of 60 t.p.h. A 36-in. by 10-ft. Carrier Conveyor Corp. natural frequency oscillating conveyor feeds the shale to its storage section.

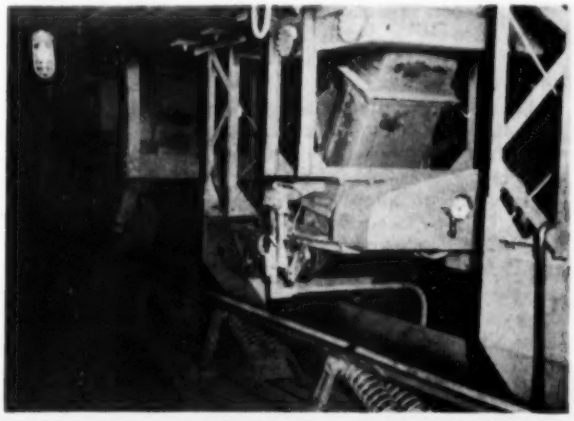
Raw Grinding The overhead crane reclaims handles the stone, shale, sand, and iron ore to individual elevated concrete bins running across the crane storage and in line with the raw-grinding mill. Stone is withdrawn from its 200-ton hopper by a Link-Belt reciprocating feeder; and shale, sand, and iron ore are withdrawn through Hardinge c/w feeders from the other bins. These feeders are all kept adjusted to give the desired raw mix. They discharge onto a 24-in. by 65½-ft. Carrier oscillating conveyor which feeds the blended raw materials into a Hammermills Inc. HM-03 hammermill to be crushed down to minus ¾-in. size. This machine is driven by a 75-hp. motor at 12 r.p.m.

A 26-ft. pick-up elevator discharges the crushed raw material from the hammermill direct into the feed end of the 8- by 40-ft. Allis-Chalmers 3-compartment Compeb mill which does the raw grinding. Water is added at this point to form a 36 percent slurry for wet process grinding.

The first compartment of the mill is loaded with 51,000 lb. of 4-in. balls; the second with 75,000 lb. of 1½-in. balls; and the third compartment with 70,000 lb. of ⅞-in. balls. The mill grinds at the rate of 40 t.p.h. to a fineness of 90 percent through 200-mesh. It is driven at the rate of 19.85 r.p.m. by a 1,000-hp., 180-r.p.m. Allis-Chalmers synchronous motor through a Cutler-Hammer magnetic clutch.

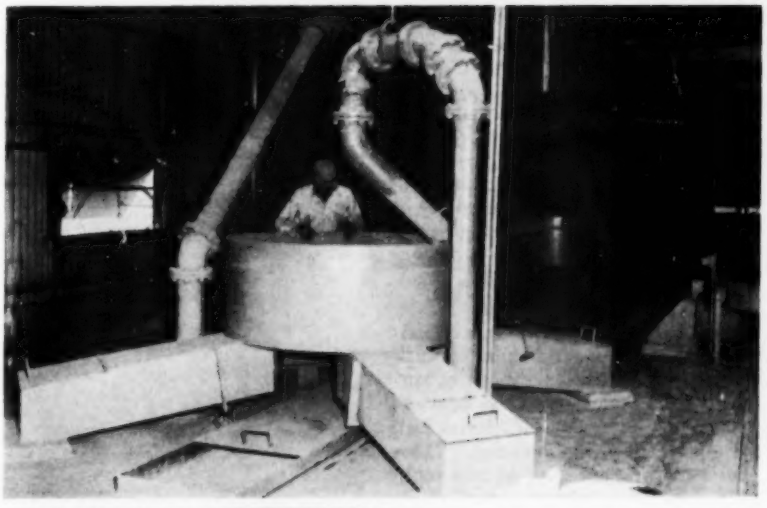
The slurry is discharged from the mill over a 4- by 5-ft. single-deck Tyler Hum-mer screen which removes all plus ¼-in. material known as "spitzer". The amount of coarse material collected is small; it is mixed with water and returned to the feed end of the mill by a No. 1K Wilfley pump.

Slurry Blending and Feeding A No. 3K Wilfley pump feeds the screened slurry to the slurry tanks, located at the feed end of the kilns about 500 ft. away. Because of the desirability for quick changeovers in manufacturing various types of cement no large mixing basin is used. Instead, there are eight 20-ft. diameter by 31-ft. high concrete slurry silos, arranged in two rows of four each, and each with a capacity of 1,000 bbl. The slurry pipeline discharges through a distributing box or vortex into any of



Right: The oscillating conveyor which carries raw materials from the feeders above to the raw mill.

Below: The vortex units used for distributing slurry into the eight blending and kiln feed silos.



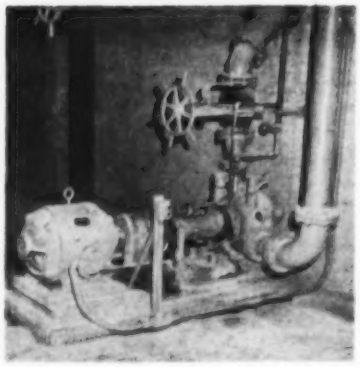
The indicating and recording instruments in the laboratory below, which show the conditions in each of the eight slurry silos.

the four silos nearest the raw mill. The other four silos are used for kiln feed. All are equipped with Dorr slurry mixers, and Massco-Grigsby pinch valves are used on all slurry lines. Two 3-in. Wilfley pumps make it possible to blend from either pair of receiving silos to either pair of kiln feed silos. In practice each tank is tested as soon as it is full. It is then blown with air and tested again.

The bottom of each silo is 12 ft. above ground level, and about half of the space on the ground floor below is used for the modern, up-to-date plant chemical and physical laboratories. The other half is used for the slurry pumps and lines, a Fuller 519-c.f.m. rotary air compressor and an extra washroom for this department. In the laboratory is a control board with Foxboro indicators and recorders for each of the eight silos. These show the amount of slurry in each tank and what is going on all the time—which tank is receiving slurry from the mill, which transfers are being made, and which tank is feeding to the kiln.

Another 3-in. Wilfley pump feeds blended slurry from the tanks to an Allis-Chalmers ferris-wheel feeder. This slurry, with a small stream of dust from the kiln stack dust collector, is discharged into a vortex feed tank which thoroughly mixes them, and then through a pipe into the kiln.

Burning and Cooling The 11- by 375-ft. Allis-Chalmers all-welded kiln is supported by six tires on six sets of single 2-roller supports. It is rotated, usually at the rate of 60 rev. per hr., through an Allis-Chalmers "Duo-Tork" drive, consisting of two separate drives on opposite sides at about the center of the kiln, each drive consisting of a 75/100 hp., 400-1,200



One of the slurry pumps and the pinch valves under the slurry silos.

r.p.m., adjustable-speed, taper-rated Allis-Chalmers 230-v. d.-c. motor and a Falk speed reducer. Power for these motors is supplied by a 200-hp. Westinghouse motor-generator set. A balanced load is kept on each motor by hand-regulated speed controls and ammeters on the kiln control board. There is a rheostat for each motor and a vernier rheostat for both. This type of drive operates very smoothly with no backlash. An auxiliary gasoline engine can be used in an emergency. About 17 ft. from the feed end of the kiln there is a 55-ft. section of heat exchanger chains.

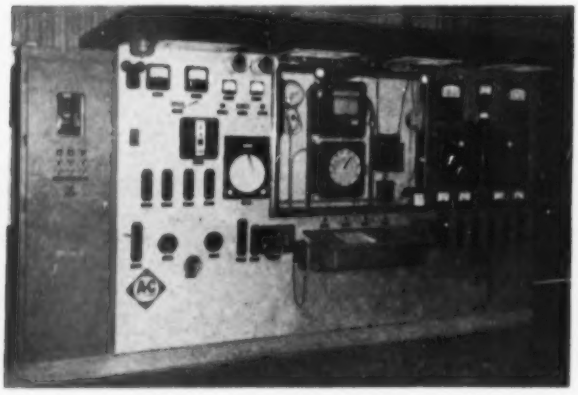
The kiln is fired by a Raymond No. 533A 12,000-lb. per hr. direct-firing coal mill which is driven by a 200-hp., 2,300-v. Westinghouse squirrel cage motor. Raw coal with a maximum size of 1½ in. is received by rail and discharged to a track hopper at one end of the covered storage building. A reciprocating feeder discharges the coal to a 61-ft. bucket elevator followed by a 16-in. by 86-ft. screw conveyor which discharges it into three 100-ton bins in the covered crane storage. The same unloading system is used for gypsum. Coal is reclaimed from these bins to an 18-in. by 63-ft. Carrier oscillating conveyor, and a 56-ft. bucket elevator feeds it to a 16-in. by 44-ft. screw over the coal mill feed bin. The mill grinds the coal to a minimum of 97 percent passing 100-mesh; and preheated air is drawn from the kiln hood through a dust cyclone at a regulated temperature of about 400 deg. F. The amount and temperature of air is varied with the amount of moisture in the coal. A 12-in. water-cooled burner pipe is used.

The clinker leaves the kiln at a temperature of about 2,200 deg. F. and falls by gravity on the sliding grates of a 6- by 33-ft. Fuller inclined grate clinker cooler. Air from a New York Blower 35,500-c.f.m. fan driven by a 50-hp. G. E. motor is blown through a duct under the grates and up through perforations in the grates through the moving bed of hot clinker. The clinker, cooled to about 125 deg. F., falls by gravity from the cooler into the clinker pit in the crane storage. Air from the hot end of the cooler enters the kiln as secondary air at a temperature of about 1,800 deg. F. Excess air from the discharge end of the cooler is released to the atmosphere through a 7½- by 50-ft. steel stack at a temperature of about 250 deg. F.

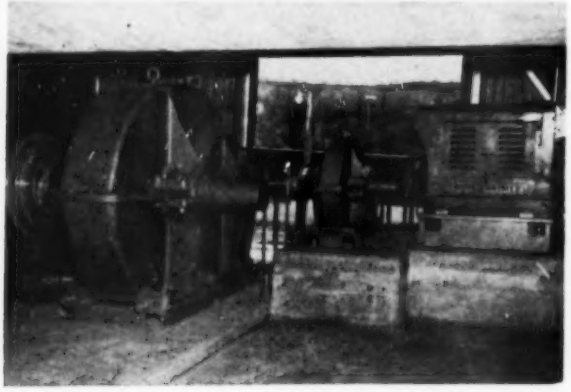
The kiln gases leaving the feed end of the kiln at a temperature of about 800 deg. F. pass through a Western Precipitation Corp. Multiclone 125,000-c.f.m. dust collector, and are discharged by a 125,000-c.f.m. Robinson kiln draft fan to the 10-ft. interior diameter by 150-ft. high Rust reinforced concrete brick-lined stack. The fan is driven by a 250-hp. Westinghouse Type CSP motor through V-belts.

The reclaimed kiln dust from the Multiclone collectors is carried by a 12-in. by 21½-ft. screw conveyor to a 56-ft. bucket elevator which discharges it to a 12-in. by 12-ft. screw conveyor over a 40-ton dust bin. This conveyor, in turn, feeds a 4-in. by

The main control panel for the kiln and its related equipment, including the slurry feeder, cooler, coal mill, draft fan, etc.



One of the two units of the dual kiln drive, with the auxiliary gasoline engine at the right.



17-ft. screw which takes the dust at a predetermined rate, with the slurry, into the vortex mixer supplying the kiln. Any dust in excess of requirements overflows into a storage bin, from which it is returned to the circuit by a drag chain conveyor feeding the above elevator. The drag chain is used because it eliminates danger of flooding of the hot and fluid dust. Dust can also be loaded from this bin into trucks for disposal if desired.

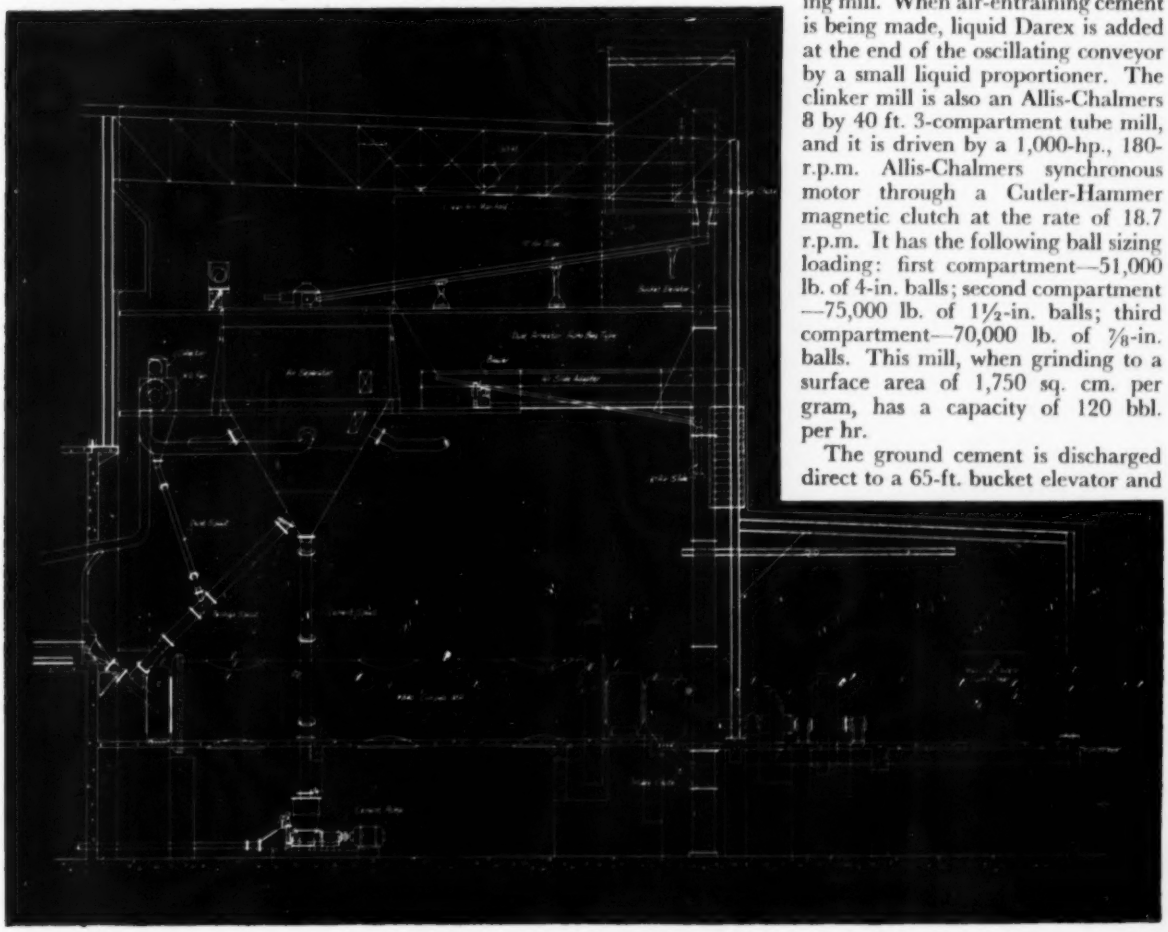
The kiln is operated to maintain a constant rate of coal feed, and the kiln speed—which means also the rate of slurry feed—is varied to maintain proper burning conditions. Oxygen is maintained at about 2 percent, and the temperature in the burning zone at about 2,700 deg. F. Under these conditions and running the kiln at about 60 rev. per hr. (speed varies between 50 and 80 rev. per hr.), the capacity has averaged 2,400 bbl. per hr. with a fuel rate of 100 to 105 lb. per bbl. of 13,000 B. t. u. coal.

The temperature of the primary air entering the kiln via the coal mill is about 400 deg. and that of the secondary air direct from the cooler is about 1,800 deg. F. The products of combustion enter the chain heat exchanger section of the kiln at about 1,300 deg. F. and leave the kiln feed end at about 800 deg. The temperature entering the draft fan is about 620 deg. F.

The kiln control system is centered in the main control panel, which is equipped with numerous speed, revolution, and temperature recorders, as well as the electrical controls of the unit coal mill, kiln, cooler, slurry feeder, and draft fan drives. Among the many instruments is one new to the industry—an electric demand meter which records graphically the flow of coal in lb. per hr. This is interlocked with a counter in the coal feed pipe which levels out any surges. Also recorded graphically are the kiln speed and slurry feed rate on one chart; the temperature at the discharge end of the chains (there are two thermo-couples at this point, one recording the temperature of the gas entering the chains and the other that of the nodules leaving them); the temperature at the feed end of the kiln (by a Leeds-Northrup Micromax electric eye sighted on the kiln lining, not on the load) and at its discharge end (via a thermocouple); the temperature of the air entering the coal mill; and the percentage of primary air. There are indicating and recording instruments for draft at the kiln hood and at the kiln draft fan. Indicating instruments include one for primary air temperature. Also on the board are flashing lights to indicate slurry overflow at the kiln feed. Electrical disconnects stop the kiln automatically in case of misalignment or other disaster before it can run off the idlers or be otherwise seriously damaged. Automatic controls for the cooler are also on this board.

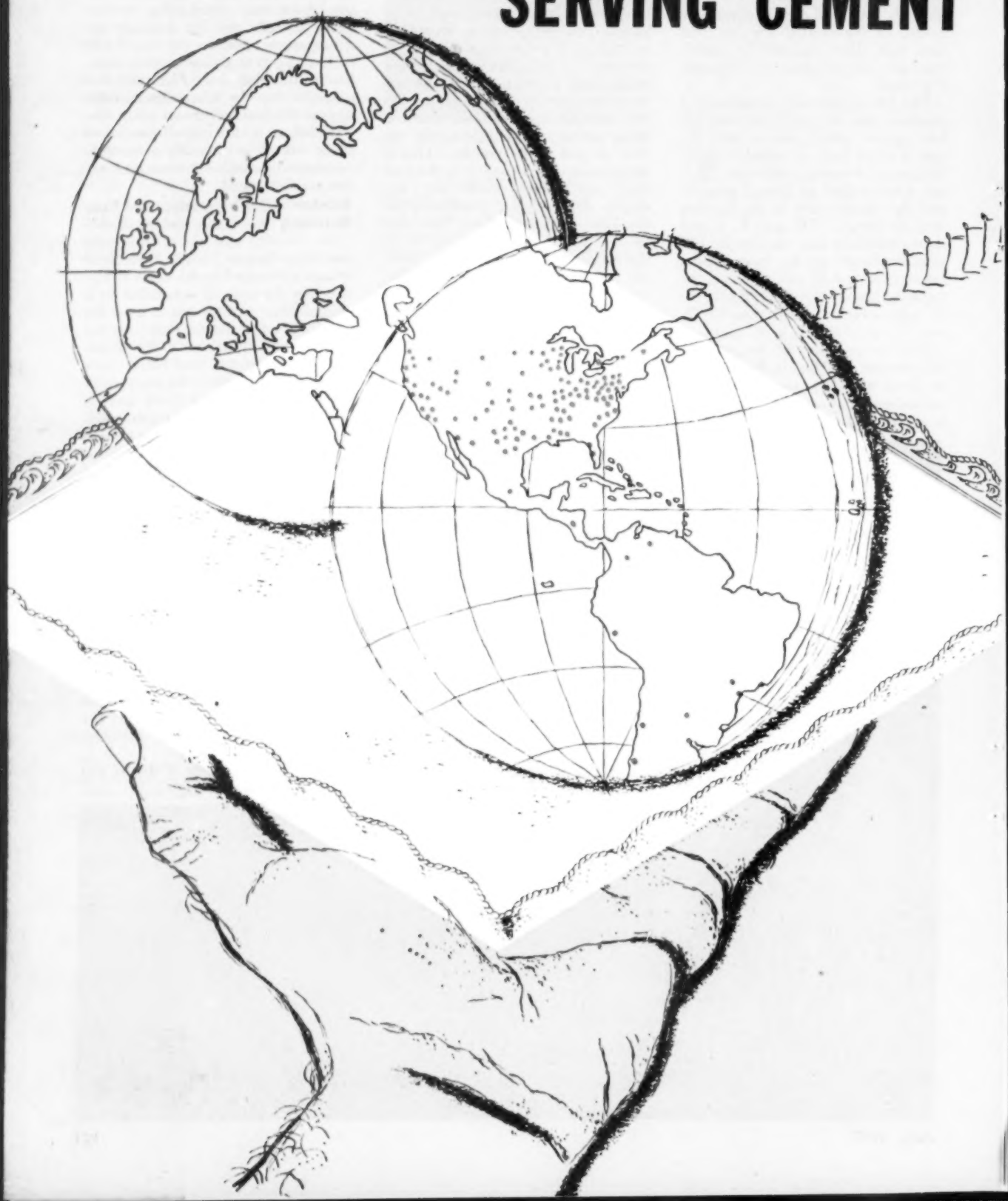
Clinker Grinding Clinker is rehandled from the crane storage building into one of three mill feed bins. Gypsum, which is received in cars and stored by the same equipment as the coal, is rehandled to a second bin. A third bin is used for limestone when mortar cement is being made. Hardinge C/W Feedometers proportion and blend these materials onto a 24-in. by 51-ft. oscillating conveyor which feeds directly into the feed end of the finish-grinding mill. When air-entraining cement is being made, liquid Darex is added at the end of the oscillating conveyor by a small liquid proportioner. The clinker mill is also an Allis-Chalmers 8 by 40 ft. 3-compartment tube mill, and it is driven by a 1,000-hp., 180-r.p.m. Allis-Chalmers synchronous motor through a Cutler-Hammer magnetic clutch at the rate of 18.7 r.p.m. It has the following ball sizing loading: first compartment—51,000 lb. of 4-in. balls; second compartment—75,000 lb. of 1½-in. balls; third compartment—70,000 lb. of ⅞-in. balls. This mill, when grinding to a surface area of 1,750 sq. cm. per gram, has a capacity of 120 bbl. per hr.

The ground cement is discharged direct to a 65-ft. bucket elevator and



Sectional view of the clinker grinding department, showing mill and motor, separator, elevator, conveyors, etc.

SERVING CEMENT



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Wherever there's a red dot . . . RITEX has been *on* the spot! From border to border, ocean to ocean—and across the seas, too—Grefco has been serving the cement industry for nearly half a century.

Grefco's patented RITEX has been used in *many more* kiln linings than any other Basic brick—*burned*, *unburned*, or *chemically bonded*. Definitely, RITEX is the pioneer of successful Basic brick linings for rotary kilns burning portland cement clinker, dead burned dolomite, and dead burned magnesite.

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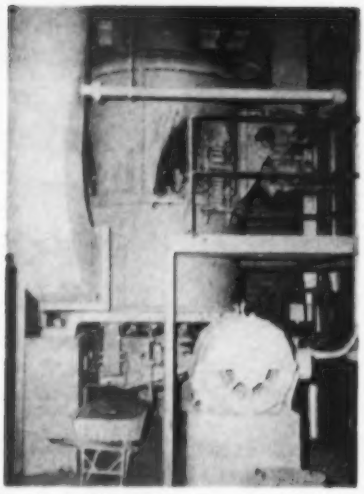
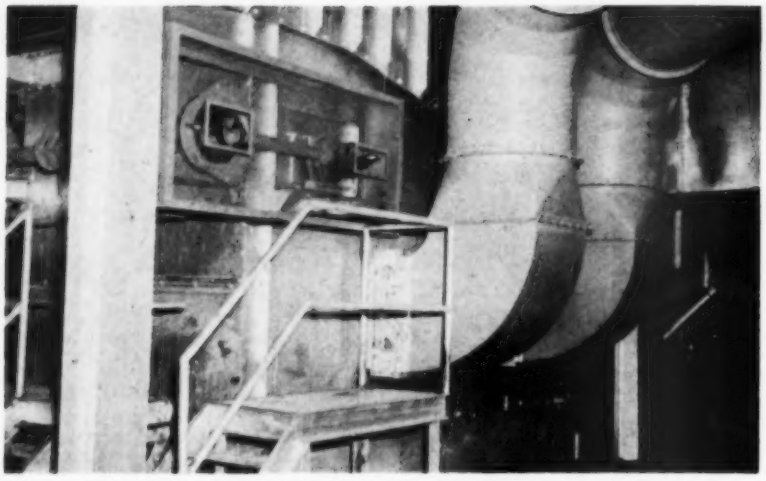
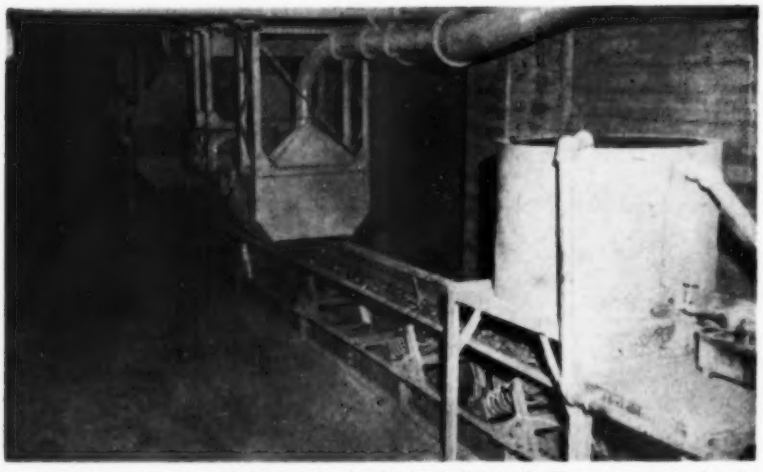


The bowl mill used for direct-firing the kiln.



The 6- by 33-ft. inclined grate cooler which reduces clinker temperature to 125 deg. F.

The 125,000-c.f.m. stack dust collectors, with the duct to the draft fan at the right.



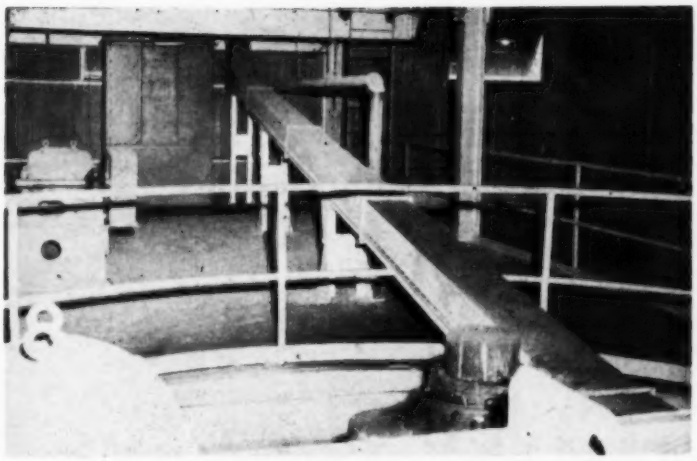
The oscillating conveyor and feeders to the finish-grinding mill. The proportioner for the liquid air-entraining agent is at the right.

then by a 12-in. by 38½-ft. Airslide to the 16-ft. Sturtevant separator, which is driven by a 100-hp. motor. The oversize is returned to the feed end of the tube mill, and the finished cement is spouted to a 6-in. Fuller-Kinyon pump which distributes it to storage. Air for this pump is supplied by a Fuller 585-c.f.m. rotary compressor. The separator is connected to a 30-ft. long Norblo bag-type dust collector, and cool outside air bled into the separator is drawn through the collector by a 13,000 c.f.m. fan, cooling the cement in the separator varying from 200 to 300 deg. F. down to 120 to 190 deg. F., respectively, as it enters the pump. The dust collector also ventilates the discharge end of the tube mill and elevator, thereby eliminating any dusty condition during the grinding of the clinker. The collected dust is returned to the separator feed elevator by an 8-in. by 38-ft. Airslide.

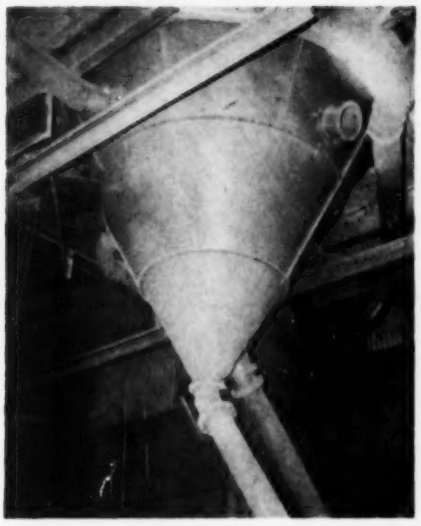
Storage and Packing The cement line from the mill building has a valve-controlled distributing system for feeding either to the old original stockhouse or to the newer reinforced concrete storage silos. There are eight silos, each 27-ft. in diameter by 80-ft. high, and these, with their three interstices, have a combined capacity of 100,000 bbl. The old stockhouse has a capacity of 25,000 bbl. Each storage has a separate packhouse connected by an overhead bridge and conveyor. A St. Regis 4-spout packer in the one serves the old stockhouse; and two others serve the silo packhouse. Both have slat conveyors for feeding loaded bags to cars for shipment.

Four additional silos are now being built, which will add 44,000 bbl. to the cement storage capacity. A 5,000-bbl., 4-compartment concrete bulk silo is also being built for loading either railroad cars or trucks. This will be equipped with a 50-bbl. Blaw-Knox batching bin and scales which will load a 400-bbl. car in 20 min. A bucket elevator and a screw conveyor will fill this bin at night so as not to interfere with packing and loading of bagged cement in the daytime. This building will be vented to a Sly 1,400-c.f.m. bag-type collector.

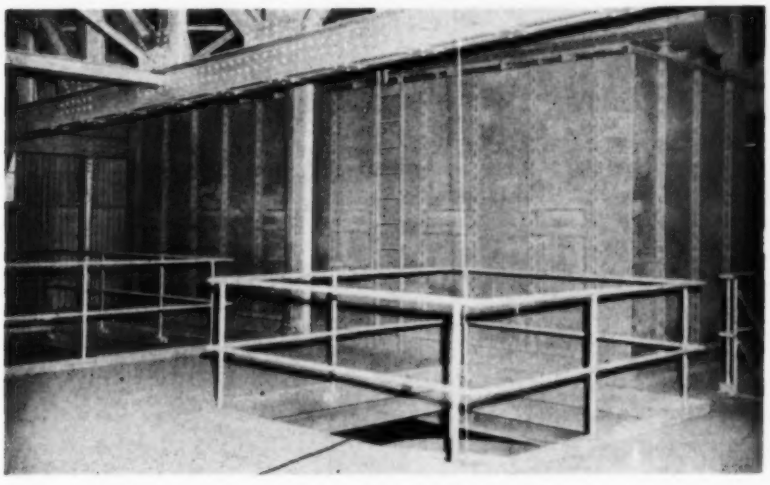
Chemical The laboratory, as has been stated, is located on the ground floor under the slurry silos and is fully equipped with all of the necessary chemical and physical testing equipment. Its location puts the full responsibility of slurry blending and the choice of slurry silos for kiln feed under the chemical department's control, as well as operation of the same. W. H. Garis, chief chemist, has a staff consisting of an assistant chemist, a physical tester, a relief man, and four sample takers —one for each of the three shifts.



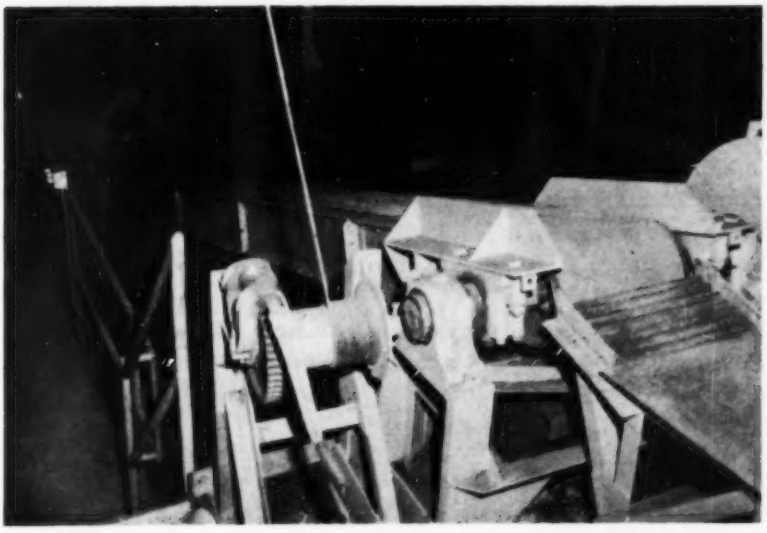
The elevator and conveyor feeding finish-mill product to the separator in the foreground.



Right: The 16-ft. separator which returns oversize from the finished cement back to the mill.



The bag-type dust collector in the mill room, which is also used to cool the cement.



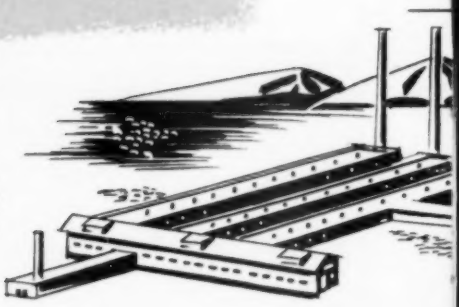
The belt conveyor used to carry refractory brick from the basement to the kiln floor.

The laboratory equipment includes a turbidimeter and a Blaine machine for fineness tests, muffle furnaces, and the other usual items required for making the necessary chemical analyses. In the physical department is a Baldwin 10,000-100,000 lb. dual-range compression tester, a briquette tester, a moist cabinet, an autoclave, and the other necessary equipment. In a separate room there are the usual laboratory crusher, pulverizer, sieve shaker, etc. Most of the laboratory equipment and the furniture was supplied by the Fisher Scientific Company.

Electrical Power Electric power used in the plant is supplied by the Niagara - Mohawk Power Company at 32,500 volts. This is reduced to 2,300 v. at the main outdoor substation and then goes to the main plant control board, from which it is distributed to seven cubicles in various departments of the plant for further reduction to 440 v. Each station also has its own lighting transformer. All motors operate on 440 v. power except those driving the two compeb mills, the kiln fan, and the coal mill, which are 2,300 v. The electrical system operates at near unity power factor due to the two 1,000-hp. synchronous mill motors and the 220-hp. synchronous motor of the motor-generator set which powers the dual-motor kiln drive. All control circuits have pilot lights to show when they are in operation. Controls at each of the two mills are interlocked, so that any stoppage automatically stops all the equipment preceding them in the flow. All wiring from the main switch board is above ground in conduit and all 2,300-v. equipment is grounded at one central point for safety.

(*Continued on page* 128.)

Cebu



PORTLAND CEMENT COMPANY IN THE PHILIPPINES AGAIN SELECTS NORDBERG CEMENT MACHINERY FOR *another* COMPLETE PLANT

The Cebu Portland Cement Company is one of the important basic industries in the Philippines . . . supplying most of the cement used throughout the Islands.

To supplement their original plant on the Island of Cebu, the company is now building a new modern plant near San Fernando, in La Union Province, northwest of Manila on the Island of Luzon.

Following the end of World War II, Cebu selected Nordberg machinery to modernize its cement plant on the Island of Cebu. Now, Nordberg Manufacturing Company has again been selected by Cebu, to provide all of the machinery, *and the technical "know-how"* for Cebu's new 2,000-bbl. per day portland cement plant. Two 8′-6″x 32′-0″ two-compartment mills, and a 10′x 336′-8″ rotary kiln are included in the machinery being supplied by Nordberg for Quarrying, Crushing, Raw Grinding, Slurry Storage, Burning, Cooling, Coal Pulverizing, Material Storage, Clinker Grinding, Cement Storage and Pack House, Electrical Distribution System, Machine Shop, Laboratory, and General Plant Equipment.

This is another example of the way in which leading producers all over the world have chosen Nordberg throughout, to deliver maximum output at lowest possible cost.

If you are considering a new cement plant, or a change in existing operations, it will pay you to investigate the advantages of Nordberg machinery and the technical and engineering services available.

Write for further information.

NORDBERG MFG. CO., Milwaukee, Wisconsin

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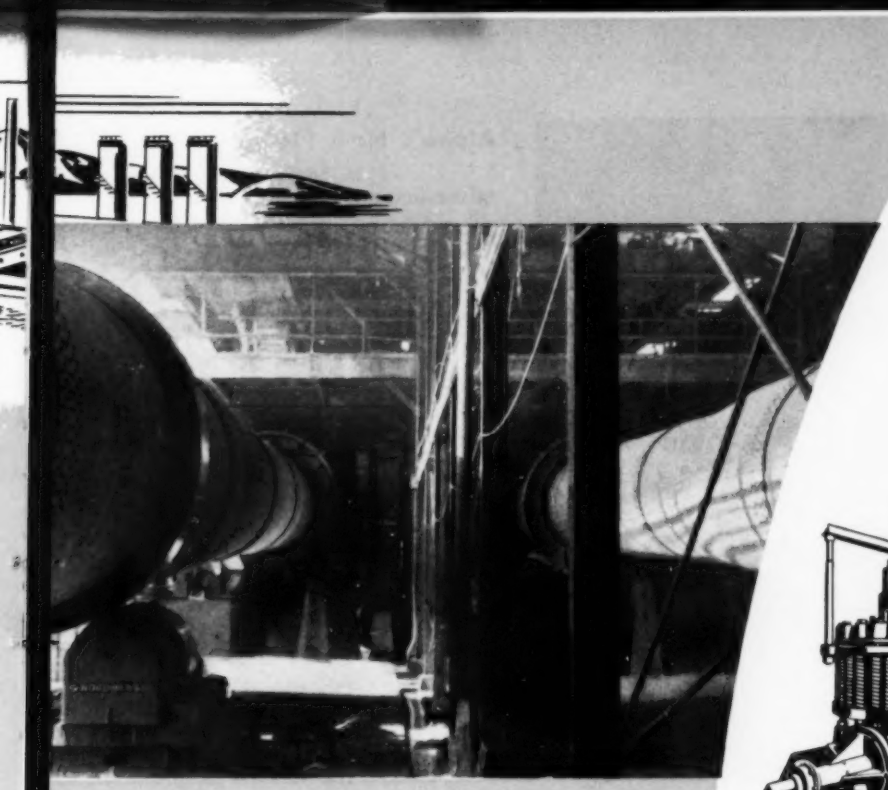
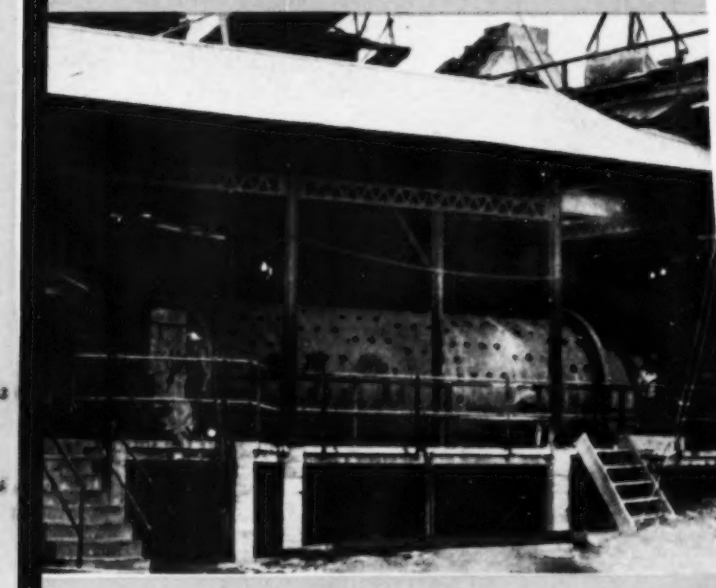
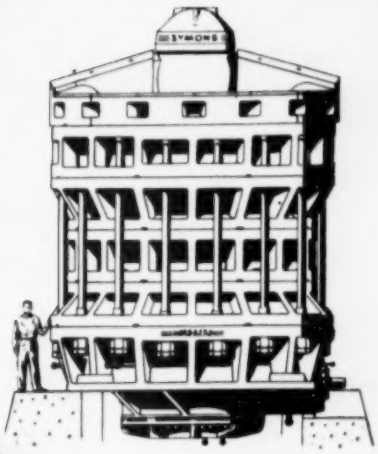


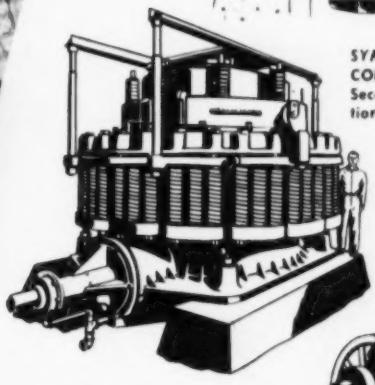
Shown above is a view of the two Nordberg 10′ x 11′ x 173′ Rotary Kilns in operation at the original Cebu plant at Naga on the Island of Cebu, which were installed following World War II.

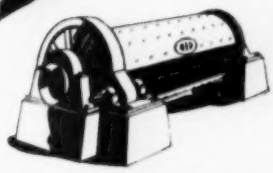


This view shows one of the two Nordberg 8′-6″ x 36′ two-compartment mills used for Raw and Finish Grinding at the Naga Plant.

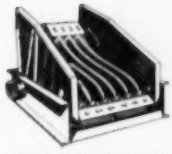


SYMONS GYRATORY and CONE CRUSHERS for Primary, Secondary and Fine Reduction Crushing.

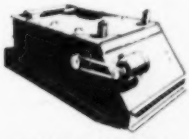




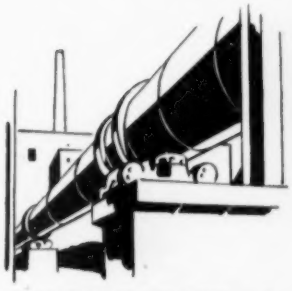
NORDBERG GRINDING MILLS for Wet or Dry Raw Grinding and for Preliminary and Finish Grinding.



SYMONS VIBRATING BAR GRIZZLIES.

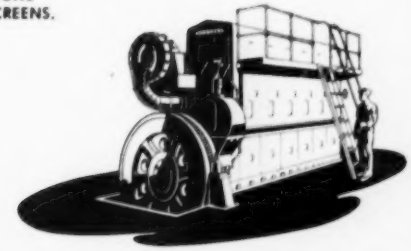


SYMONS HORIZONTAL and ROD DECK VIBRATING SCREENS.



NORDBERG DRYERS, KILNS and COOLERS for Pyro Processing Operations, Drying, Calcining, Burning and Cooling.

SYMONS "V" SCREENS.



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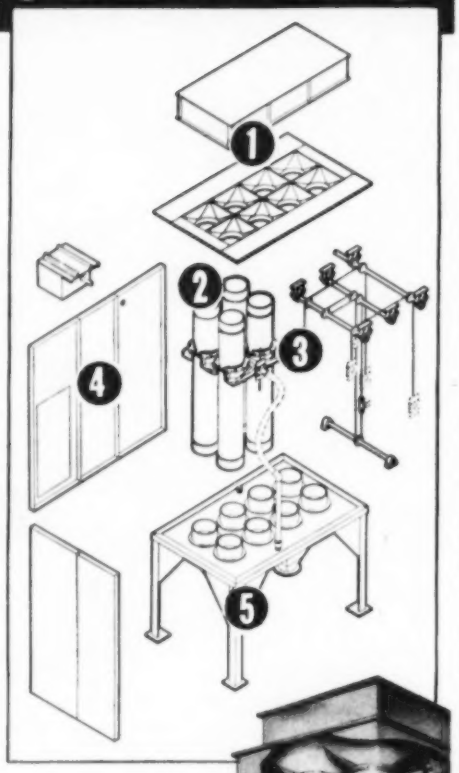
AEROTURN Dust Collectors

will give you high volume air-cleaning



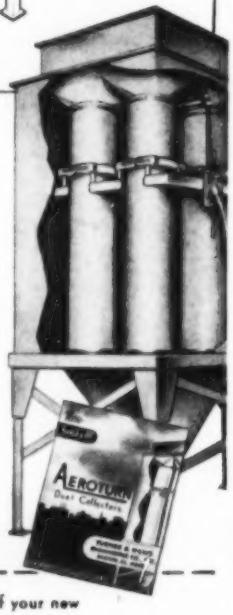
1 Dust and dirt-laden air enters plenum casing at top of the collector for equal distribution to filter bags.

2 12-inch diameter filter bags, made of tough, durable, pressed wool felts of ultra-high filtering efficiency, trap dust down to submicron size.

3 To prevent clogging of the filters, polished aluminum blow rings travelling up and down exterior of filter bags slightly indent the bags and blow a high-pressure, reverse-air-jet through the walls. Accumulated dirt on the inside of the filter bag is dislodged by impact of the jet.

4 Air cleaned of 99.9% or more of its dust and dirt can then be recirculated within the plant, or may be exhausted directly and safely into the community.

5 Dislodged dirt falls into the hoppers below the filter bags for disposal.



Whatever your dust problem, you'll find the Series 12 can do an effective and efficient dust collecting job in your plant. Satisfied users in many industries have found that their Aeroturns provide high cleaning efficiency with extremely low maintenance and occupy only ⅓ to ½ the space required by other dust collectors. They've also saved 50% to 75% in erection time and costs due to simplified assembly.

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PQ

Alpha's New Plant

(*From page* 125.)

Miscellaneous Water required for slurry, bearings, etc., is pumped from a pond adjacent to the plant by a 250 g.p.m. vertical electrical direct-driven pump with one in reserve. Water for drinking and for the wash houses is supplied by the local town water company.

There is an unloading platform on the railroad siding for handling plant repair parts. A hydraulic elevator delivers them to the ground floor storage space under the mill feed bins. Kiln lining brick is stored on pallets in the basement under the kiln. A fork lift truck carries them to an inclined belt conveyor which takes them to the kiln floor.

Credits The basic design of this plant was prepared by Alpha's engineering department under the general supervision of Howard Hanks, vice-president. The Macdonald Engineering Company of Chicago, Ill., did the detailed design of the plant and had the general contract for its construction, and for installation of the equipment, subletting some of the specialized work such as excavation, electrical, water and air lines, etc., to local concerns. The Rust Engineering Company built the reinforced concrete kiln stack. Victor W. Anckaitis was resident construction engineer for Alpha.

The Allis-Chalmers Mfg. Co. supplied most of the heavy equipment, including the kiln, the two grinding mills and their 100-hp. motors. The General Electric Co. supplied the main switch-gear, and most of the motors are Westinghouse. L. Burmeister supplied the bucket elevators. The Carrier Conveyor Corporation of Louisville, Ky., supplied the balanced NF (oscillating) conveyors.

Most of the new buildings are of steel frame construction with Transite siding and roofing; some of the smaller buildings are concrete or concrete block.

Limestone Rendered Capable Of Carrying Insecticides

Entomologists of the Department of Agriculture have reported a free-flowing limestone dust which gives good coverage of plants from airplane and ground equipment.

Previously limestone has been considered too alkaline and mechanically unstable for use as a carrier dust. However, according to the U.S.D.A., a Southern manufacturer has developed a chemical process yielding a dust which flows freely and which can be stored even under moist conditions.

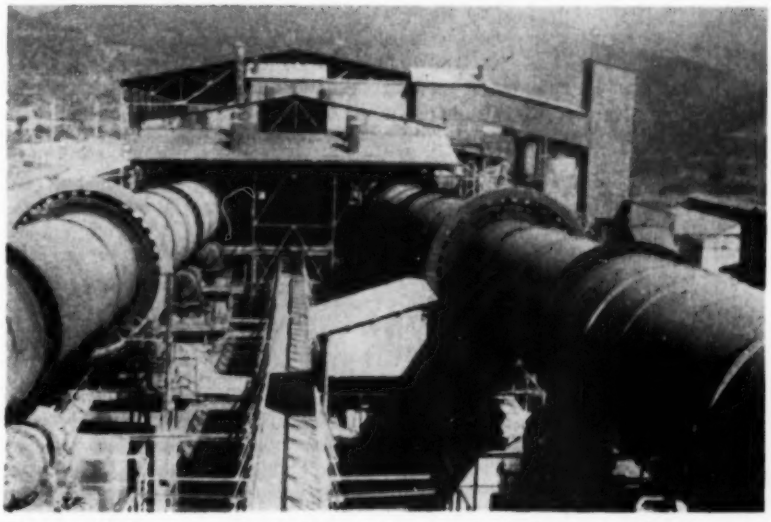
Chilean Cement Concern Uses Flotation To Cut High-Silica Content of Raw Material

Cemento Cerro Blanco de Polpaico, S. A., latest of series of nonmetallic mineral developments in Chile, closes first year of operation.

THE problem of increasing the production of portland cement in Chile has long been of paramount importance. The industrial development of Chile has been such as to require the use of large quantities of cement, and the type of construction used throughout the larger cities emphasizes this need. In addition, the development of good highways has been greatly retarded by the fact that the supply of cement was limited.

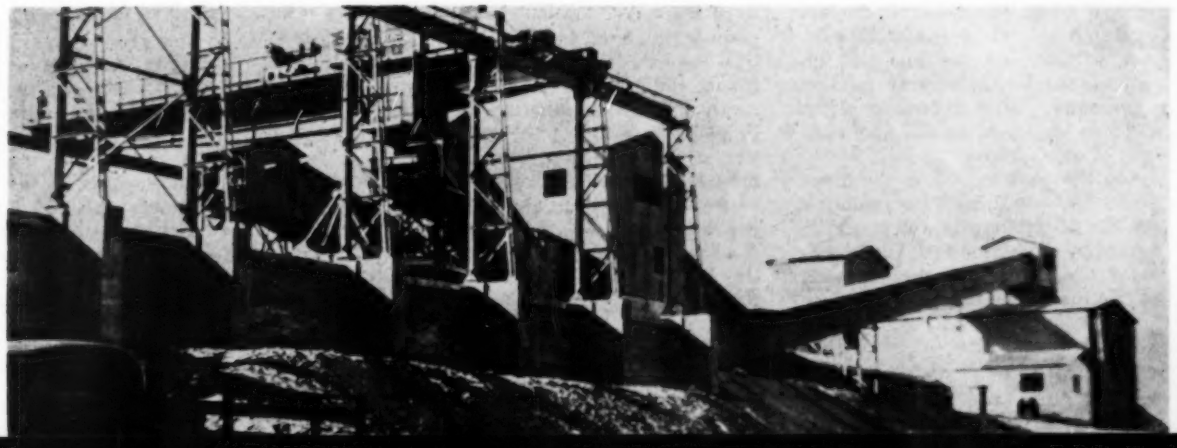
It has been known for many years that one of the best deposits of raw materials, considered in relationship to the potential market for cement, was in the vicinity of Polpaico. This city is approximately 30 miles north of Santiago, on the main line of the railroad running from Santiago to Valparaiso. The deposit has the added advantage of being directly alongside the new Pan-American Highway. Consequently, from the standpoint of deliveries to the Santiago area, which uses approximately 65 percent of the total of the cement consumed in Chile, the location is ideal.

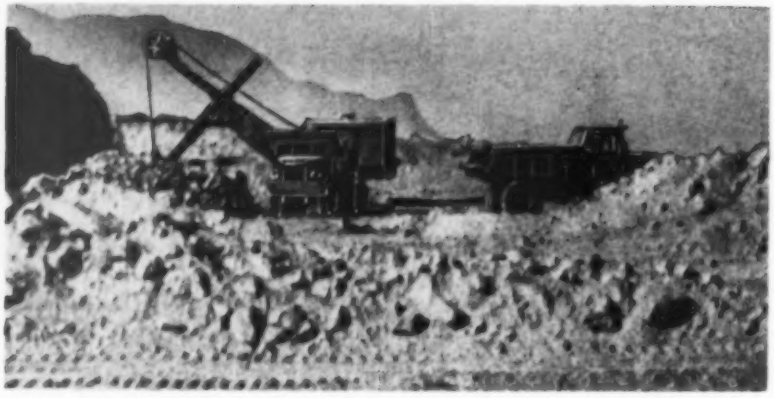
These deposits of limestone are in the form of a series of low-ranging hills, more or less circling the Valley of Polpaico. Quite a few small lime and agricultural limestone plants have been operating in these hills for many year. The materials have been subjected to extensive exploration and analyses since approximately 1929. However, the actual construction of a cement plant was never accomplished during these many years of study, due to the fact that the deposits are very erratic as to both chemical and physical aspects. The deposit through the range of hills is uniformly stratified, the maximum depth of the strata being 3 ft., but averaging more nearly 18 in. The strata of pure limestone are of exceptionally high quality, being a cream-colored limestone, averaging possibly 86 percent $CaCO_3$. The disturbing feature in previous explorations is the fact that the strata of good limestone are interlaced with narrow strata of a practically pure quartz. This quartz runs as high as 86 percent Si_2O_3 and, in addition, is exceptionally hard to crush and grind. In addition to the alternate layers of good limestone and quartz, there are many strata and pockets of what is locally known as "poroso". This is a decomposed limestone, which in many cases has a very high $CaCO_3$ content. On the other hand, there are other strata and pockets



The twin 300-ft. kilns at the facilities of Cemento Cerro Blanco de Polpaico, newest cement plant in Chile, which has just completed its first full year of operation.

The crushing plant, the screen house, and the raw material craneways.





Raw material at the deposit is handled by 10-cu. yd. dump trucks and tractors.

which have been permeated with clay seepage from the surface; in these the $CaCO_3$ content is quite low, and the silica content high.

In 1944 the entire area was conceded to the firm of Gildemeister & Co. Ltda., a firm which was already active in the importation and sale of heavy machinery. In addition, S. T. Gildemeister, the president, had a life-long experience in the exploitation of difficult materials due to his interest in the nitrate fields of north Chile. In view of this experience in the nitrate fields, Gildemeister adopted a more realistic approach to the problem. In 1944, a small pilot plant was installed for burning lime and manufacturing agricultural limestone. The original plant consisted of two vertical lime kilns, and an agricultural limestone pulverizing plant furnished by the Kennedy-Van Saun Manufacturing and Engineering Corporation. In addition, Kennedy-Van Saun installed a small crushing plant for preparing both the feed to the lime kilns and the feed to the grinding mill. This plant proved to be an immediate success and is still operating at maximum capacity.

The exploitation of the raw materials in connection with this pilot plant was done by hand. A considerable portion of the troublesome black quartz was wasted, as well as practically all of the "poroso". The selected stone which was used averaged sufficiently high in $CaCO_3$ content, so that both the lime and the agricultural limestone were sold at a premium. This is so because prices in Chile are based on the lime content of the product.

On the basis of the explorations made for obtaining raw materials for the pilot plant, it was generally agreed by the engineers of Gildemeister & Co., Ltda. and the engineers of Kennedy-Van Saun, who were jointly conducting the explorations, that an ample supply of raw materials was available for many years of operation. At the same time, in view of the labor situation in Chile, it was admitted that if all of the limestone had to be hand-selected and hand-loaded, the labor costs for the manufacture of portland cement from that deposit would be too high.

Further explorations and many months of additional testing indicated that the quarry could be worked partially by hand and partially mechanically, and that the general $CaCO_3$ content of the raw materials thus obtained should be increased by the process of flotation. The Separation Process Corporation then entered the picture, and a long series of tests, both in Chile and in the United States, indicated the advisability of including the flotation process of enriching the limestone by the elimination of a certain percentage of the high-silica content of the deposit. Having been convinced of the feasibility and the economic advantage of building a cement plant, and adopting these ideas, a new company was formed, Cemento Cerro Blanco de Polpaico, S. A.

On this basis, a complete wet-process cement plant was purchased from Kennedy-Van Saun late in 1945. Delivery of the machinery began in 1946, and the plant was finally put into operation in 1949. Actual construction of the cement plant was delayed by the fact that it was necessary for Cemento Cerro Blanco de Polpaico to build its own railroad from the junction point at Polpaico to the actual cement plant site at Cerro Blanco. The railroad crosses two small rivers, and in the case of the larger of these two rivers, it was necessary to sink a large series of concrete piles in order to support the bridge piers. In addition, the flat valley of Polpaico is destined—at some future date—to become a lake, due to the proposed construction of a dam at the neck of the valley. This made it necessary to construct the plant on a hillside above the proposed water level. This in turn made it necessary to raise the level of the private railroad to a point higher than would originally have been the case. Many hundreds of thousands of cubic yards of fill were necessary to raise the level of the railroad.

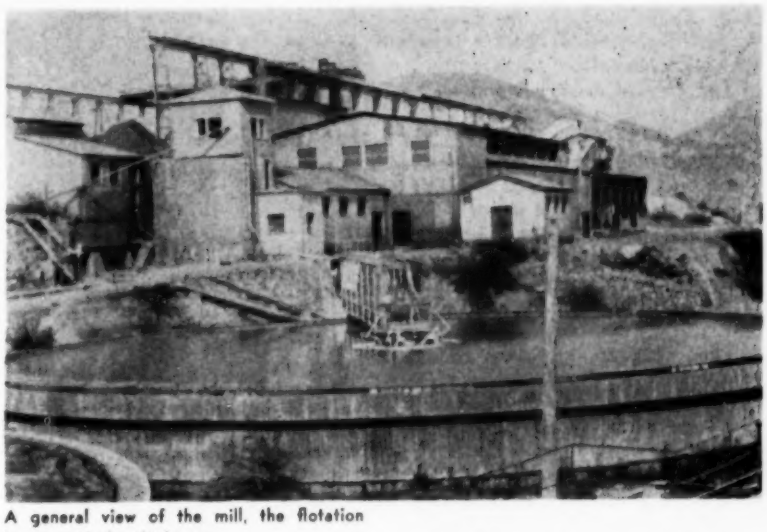
The plant itself is unique as to construction, due to the fact that it was necessary to construct it on a comparatively steep hillside. These circumstances necessitated a large amount of additional excavation; but there was the overall advantage of making the flow of material "downhill". This eliminated a considerable amount of transport equipment, and in many cases the slurry actually flows by gravity through flumes instead of having to be pumped. It is expected that the savings in power and maintenance will shortly offset the added first costs of construction.

The plant has now been in full operation for more than a year, and the method of quarrying has been well standardized. In view of the vast amount of limestone covered by the concession, various quarries have been opened at different points of the deposit, the idea being to have a more balanced quality of raw material by obtaining these raw materials from various portions of the main deposit. The acceptable limestone is selected and piled in such manner that it can easily be picked up by a 1½ cu. yd. Type K 360 Link Belt Speeder power shovel and loaded on 10 cu. yd. Euclid dump trucks and a Caterpillar DW 10 tractor with a W-10 wagon. The rejected material is pushed over the hill by a Caterpillar bulldozer. In the case of the one quarry it is cast by means of Link-Belt drag line. This system holds down the actual number of laborers to the minimum, but does bring up the general quality of the material to an acceptable point. One of the more remote quarries is still serviced by a Decauville railroad system.

The raw materials thus obtained are delivered to the main crushing house by means of either the above-mentioned railroad, by Euclid trucks or by Caterpillar wagon. At that point the rock is dumped into a very large receiving hopper and fed by means of a Kennedy heavy-duty rock feeder to a Kennedy 22 in. primary gyratory crusher. The latter is operated by means of a 100-hp. motor. A

primary belt conveyor carries the material to the screen house, where a separation is made at approximately ¾ in. The minus ¾ in. is carried by conveyor to the raw material craneway, which is serviced by a P & H 7½-ton grab bucket crane, which either stocks the material or loads the raw mill feed bins. The plus ¾-in. material is returned by a secondary belt to a Kennedy No. 49 ½-S reduction crusher, operated by a 100-hp. motor. The product of this crusher rejoins the flow of material on the main conveyor belt and is returned to the screen house in closed circuit. Two Symons disc crushers have recently been added to produce more fines and thus reduce the work of the raw-grinding mills. The latter crusher also discharges to the main conveyor belt, so that no material reaches the main deposit which has not passed through the screens. The screen house is equipped with a 5 by 12 ft. and a 4 by 12 ft. double-deck Kennedy screen.

The mill house is equipped with two Kennedy integral-gear-driven ball mills for grinding limestone, each 9 ft. in diameter by 12 ft. long, and each directly coupled to a 500-hp., 600 r.p.m. motor. Each mill is closed-circuited with a Dorr Model QSFX 16 by 28 ft. rake classifier. Material is delivered from the mills to the classifiers by means of a 9 ft. diameter Dorr sand wheel.

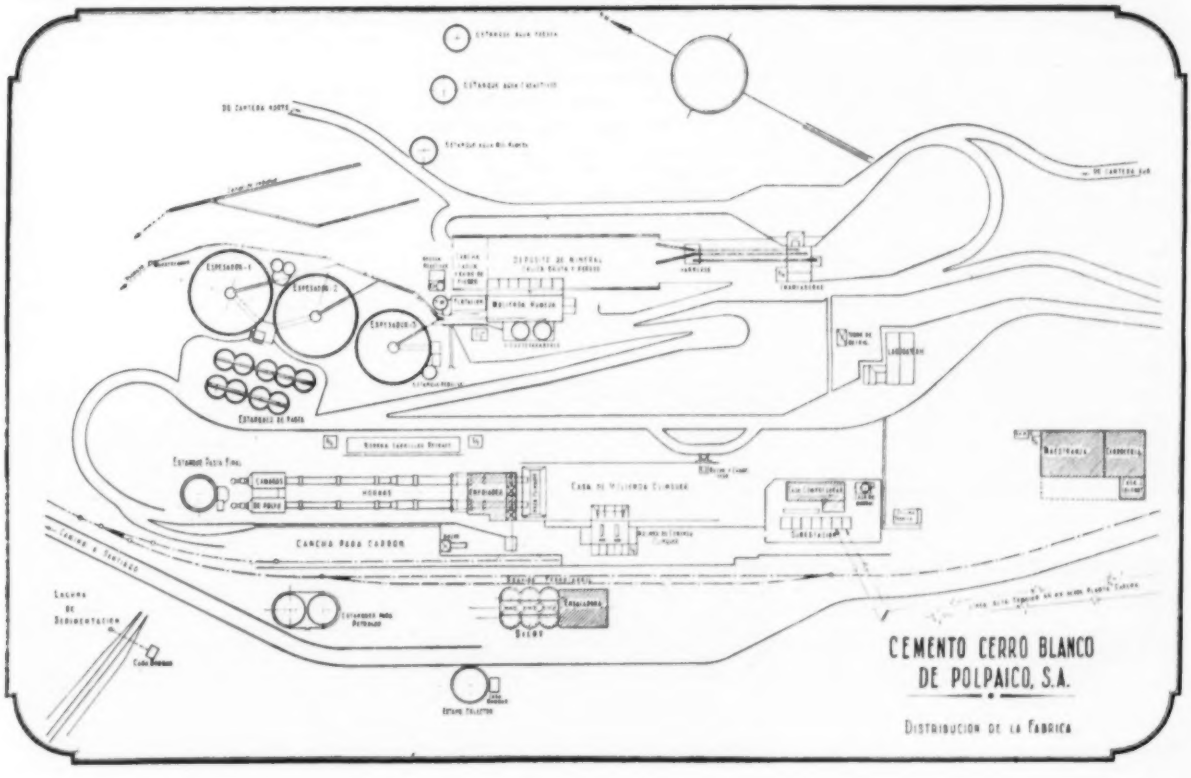


A general view of the mill, the flotation house, and the thickeners.

A Kennedy 8 by 11 ft. ball mill is installed for open-circuit grinding of the kaolin and iron ore, which are used as an admixture for controlling the chemical specifications of the kiln feed. This mill is so arranged that it can later be used in connection with a classifier, if this should become necessary. The slurry ground by this open-circuit mill goes directly to the storage silos.

The product of the two limestone mills—that is, the overflow of the two classifiers—passes by gravity to two Dorr hydro-separators. The overflow of the hydro-separators is of sufficiently high $CaCO_3$ content so that it is delivered by gravity to one of two 135 ft. diam. Dorr thickeners, without further treatment. The hydro-separator underflow passes to a Dorr Turbo Mixer and

Plan drawing of the plant of Cemento Cerro Blanco de Polpaico.



from there, through the flotation house, which consists of three groups each of seven cells.

The treated slurry then flows by gravity to either one of the aforementioned 135-ft. dia. thickeners. For further flexibility, an additional Dorr thickener of 120-ft. dia. is available; it can be used when it is not necessary to treat all of the hydro-separator underflow. The product of this thickener is kept in the circuit more or less as a reserve for balancing the final mix.

The slurry storage system consists of a battery of nine silos, each 30 ft. in. dia. by 30 ft. deep, and each equipped with Dorr combination mechanical and air agitators. The final mixture is delivered to the kiln feed tank, which is a Dorr agitated silo 60 ft. in dia. by 24 ft. deep.

The manner of controlling the kiln feed is more closely shown in the accompanying diagram and it is this carefully worked-out system which has enabled the company to feed the kilns consistently with a mixture that varies less than ½ of 1 percent at any time.

From the kiln feed tank the slurry is pumped to a battery of four disc-type filters manufactured in the company's own machine shop at Polpaico. Under normal operating conditions the slurry enters these filters at approximately 39 percent H_2O, and the resulting cake, as fed to the kilns, contains from 18 to 20 percent H_2O. This feed is reduced to an ultimate moisture content of approximately 16 to 17 percent by the addition of the recovered dust from the kilns.

The clinker is burned in two Kennedy rotary kilns, each 11 and 10 ft. in dia. by 300 ft. long, riding on five tires. The kilns are fired by means of a direct coal pulverizing system, each kiln having a 7 by 12 ft. Kennedy air swept tube mill from which the pulverized coal is drawn and directly forced into the water-cooled kiln burners by means of a Kennedy No. 829 exhauster. The coal used is Chilean coal of low calorific value and high ash content. In addition, during the winter, the coal contains a high percentage of water. Drying is accomplished entirely in the process of pulverization. A hot-air duct leading from the firing hood of the kiln carries hot air to the feed end of the mill, and the coal is dried as it is pulverized. Fully automatic temperature controls and tempering dampers control the temperature of the drying air to a point that precludes the danger of ignition or explosion.

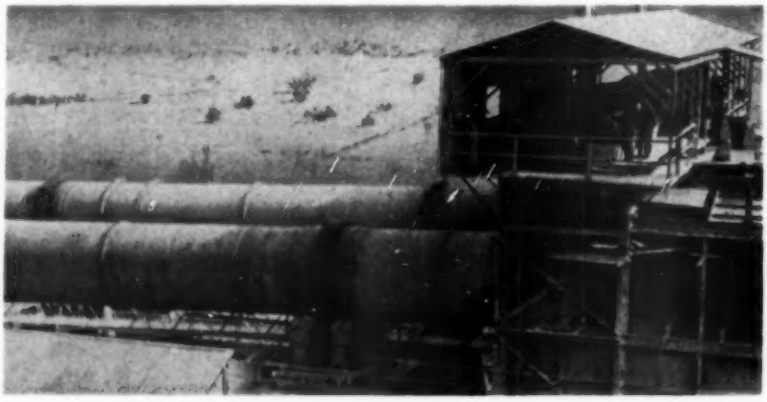
The executive personnel before the clinker grinding house: H. C. Moebius, plant superintendent; Jose Smith, maintenance engineer; S. T. Gildemeister, president; and C. M. Grisar, general manager.

The clinker is discharged from the kilns into two Kennedy rotary coolers, each 8 ft. in dia. by 80 ft. long. The cooled clinker drops into a large concrete pit under the overhead craneway, and a second P & H crane carries the clinker from the pit to storage or to the clinker mill feed bins. Gypsum is delivered by motor truck and crushed in a small jaw crusher, also delivering the material to the craneway; and this material is also stocked and loaded by the same crane.

Coal is delivered by railroad cars to a third craneway, where it is unloaded and stocked by means of a third P & H crane. Under this craneway is a receiving hopper into which the coal is dumped by the crane bucket, and from which it is carried by belt conveyor to a Kennedy 28 by 30 in. double slugger roll coal crusher. The crushed coal is elevated by an enclosed bucket elevator to a height equal to that of the coal bins over the coal mills and is delivered to the coal bunkers by means of a belt conveyor with a tripper which permits the feeding of either or both of the two coal bunkers. Before passing to the coal mills the coal is accurately weighed by means of Richardson coal scales, so that a continuous and concise record is kept of the actual coal consumption.

Clinker is withdrawn from the feed bins and fed to the clinker grinding mills by means of Merrick Feed-o-weights, which are also employed for the proper feeding and proportioning of the gypsum. Clinker grinding is done in two Kennedy 8 ft. dia. by 22 ft. long, 2-compartment tube mills. Both mills are integral-gear-driven, and are directly coupled to 600-hp., 600 r.p.m. Westinghouse motors by means of Falk flexible couplings. The mills discharge into vertical elevators which carry the ground clinker to two Sturtevant 16-ft. dia. separators. The mills are in closed circuit with these classifiers, and the finished product goes directly to two Kennedy No. 4 automatic pneumatic transport pumps, which pump the finished cement into a battery of eight storage silos located on the far side of the railroad tracks from the rest of the plant. The cement is recovered from these silos by means of Fuller-Huron Airslides and screw conveyors and is delivered by vertical elevator to a common storage hopper, which feeds two St. Regis 4-tube bagging machines. These machines are installed back to back. Under each bagging machine is a filled-bag conveyor. One conveyor takes the filled bags to the platform at which motor trucks are loaded, and the other feeds to the platform alongside the railroad on the opposite side of the baghouse. In this manner both railroad cars and motor trucks can be loaded simultaneously when required. However, due to the new concrete highway which passes the plant and leads to the City of Santiago, the major portion of the output is delivered by motor trucks and

The kiln feed and filter platform.



truck-trailer combinations. Provision is also made for the loading of bulk cement, although this practice has not been generally adopted in Chile up to the moment.

The water supply for the entire operation is obtained from a series of comparatively shallow wells. The water is pumped to steel storage tanks at an elevation considerably above the plant, so that there is ample pressure and volume throughout the plant. However, great care is taken to conserve water, and the overflow from the thickeners, as well as the cooling water, is collected and re-used. In addition, the rejects from the flotation plant are allowed to settle out in large pools constructed for this purpose. This water is pumped back into the milling system, both as a means of water recovery, and also because it contains a certain percentage of the reagents needed in the flotation process, thus reducing the amount of new reagents added. The necessary electric power is received from a company-owned hydro-electric plant about 30 miles away.

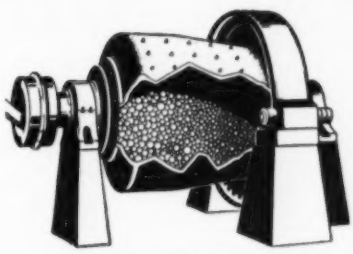
The original field engineering and preliminary design work was handled by E. N. Kunkle for Kennedy-Van Saun. Waldemar Schuetz, a very well-known Chilean industrial engineer, represented Gildemeister & Co. Ltda. during this stage of the development. Later, the newly-formed company organized its own engineering force, which completed the construction.

The plant was originally designed for a capacity of 200,000 metric tons per year of standard portland cement. The first full year's operation will end on June 1, 1953, and it is apparent that considerably more than the rated capacity of the plant will be produced.

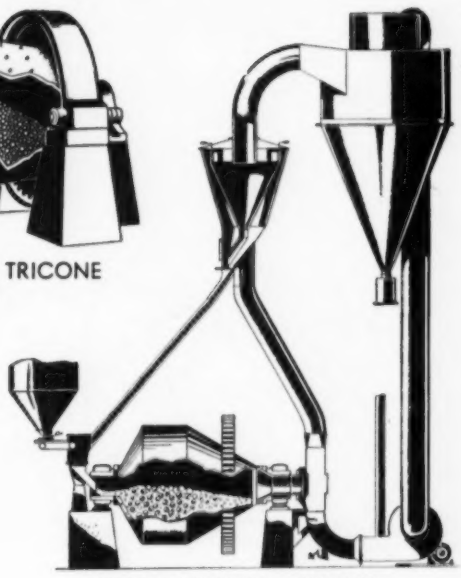
The operating personnel of the plant consists of S. T. Gildemeister, president; C. M. Grisar, general manager; Kurt Voeltzer, sub-manager, in charge of raw materials and personnel; H. O. Moebius, plant superintendent; and Jose Smith, chief engineer, who is in charge of all maintenance and the company's machine shop and foundry.

According to an announcement released by D. L. Pickett, president of the Round Rock White Lime Company, Round Rock, Tex., this company is engaged in a plant expansion program which will increase production by approximately 100 percent. Round Rock White Lime was founded 50 years ago by the late William Walsh, whose heirs have continued to maintain an active interest in the plant.

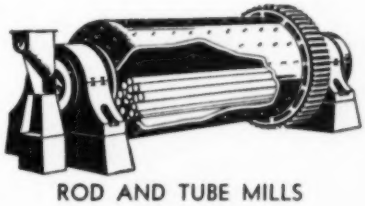
Hardinge **PROCESSING** *equipment*



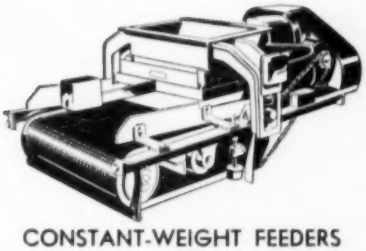
CONICAL AND TRICONE MILLS



AIR CLASSIFYING SYSTEMS



ROD AND TUBE MILLS



CONSTANT-WEIGHT FEEDERS

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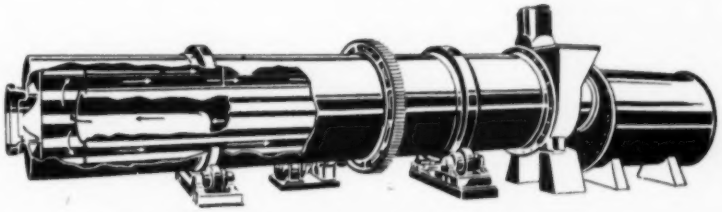

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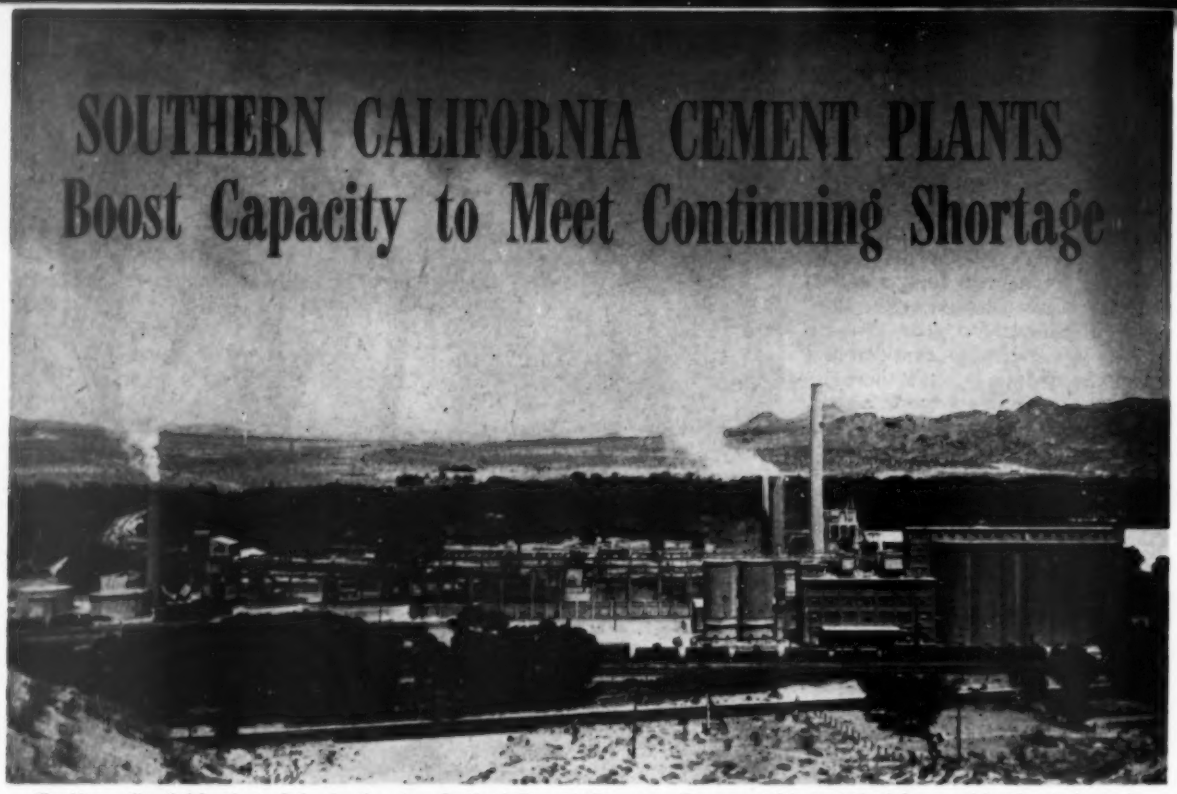
SOUTHERN CALIFORNIA CEMENT PLANTS Boost Capacity to Meet Continuing Shortage



The Victorville, Calif., plant of the Southwestern Portland Cement Company. The newest kiln is at the left, served by the single stack.

another ON THE SPOT report

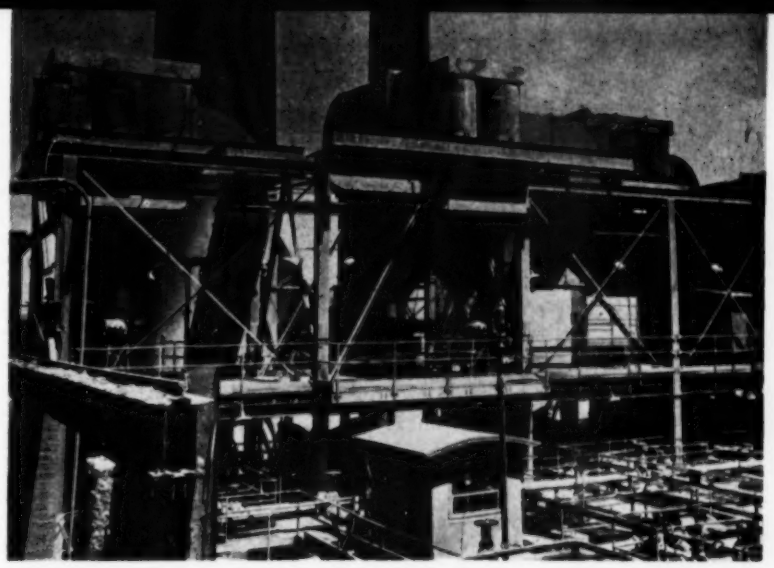
By HARRY F. UTLEY

A TIGHT situation in cement supply in southern California which developed during the spring of 1953 appears to be easing somewhat as new facilities for increased production by the mills in that area become operative. A combination of circumstances involving considerable top-priority military construction, a strike at one plant, and an unusually dry winter and spring, which permitted construction to proceed at the highest rate on record, were contributing factors to the shortage. Relief was obtained from northern California plants which shipped considerable quantities into the Los Angeles area by rail and truck. Some attempt was made by importers to bring in European cement, with little success, however, since prospective buyers would have to wait 60 days for delivery, plus time for the necessary tests.

There are five portland cement plants in southern California. No new plants have been erected in many years, although rumors have cropped up from time to time that new capital and new producers were preparing to invade that booming area. These proposals apparently dried on the vine, as surveys revealed that the existing plants were themselves planning and executing expan-

This blast-hole drill recently went into operation in Southwestern's new quarry 16 miles from the Victorville plant.

The 10½- by 330-ft. kiln installed at Southwestern's Victorville plant in 1950. Immediately below it, work is shown under way preparatory to erecting the concrete supports for a burning unit of similar size, which is expected to be in operation late in 1953.



Dust-collecting equipment on the five older kilns at Victorville.

sion programs to provide sufficient additional capacity to care for the anticipated demand, except for temporary surges.

Southern California, even with its unprecedented growth since the end of World War II, today harbors only about 4½ percent of the country's entire population, while its five cement plants account for nearly 7 percent of the industry's total capacity. These plants—Riverside at Crestmore and Oro Grande; California at Colton; Southwestern at Victorville; and Monolith near Tehachapi—have the combined ability today to turn out 19,000,000 bbl. annually. A year or two ago their total capacity was only a little more than 15,000,000 bbl. In a few years, as plans materialize, their combined yearly output may exceed 22,000,000 bbl.

Southwestern Portland Cement Co. One of the most ambitious programs currently under way is that of Southwestern Portland Cement Company at Victorville. Founded by the late Carl Leonardt, the plant's single kiln turned out its first cement on Labor Day, 1916. In 1950, its sixth kiln, a 10½- by 330-ft. unit went into service to bring its annual capacity to over 3,000,000 bbl. annually. Foundations are now being placed to support another kiln of the same size which, according to President George E. Warren, should be in operation by the end of the year, raising capacity to nearly 4,000,000 bbl., nearly double the potential which existed at the end of World War II.

An important phase of the government program also involves the opening of an extensive new quarry and crushing department 16 miles from the plant at Victorville. The new quarry will ultimately be benched at five levels, the new crushing facilities being located near the lower level. A new Joy Champion blast-hole drill

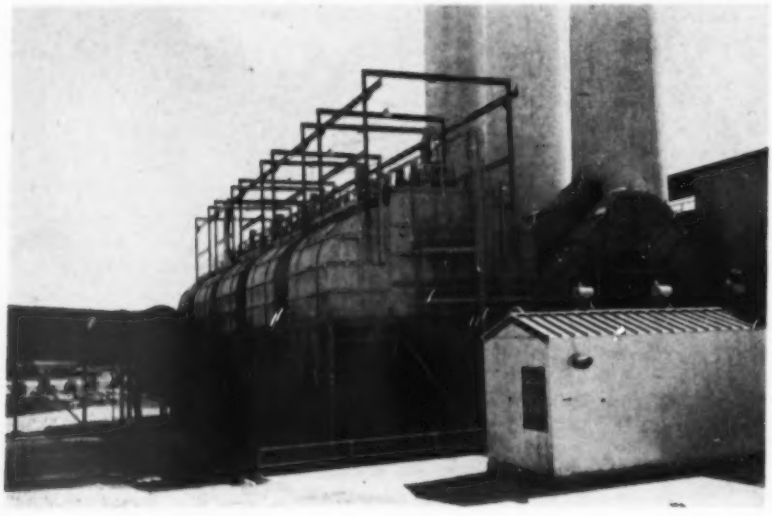
An aerial view of the Riverside Cement Company's plant at Oro Grande, Calif. Shown are all five kilns described in this article, together with other recent improvements, including the bank of eight finished cement silos in the lower left corner.

Photo by Fairchild Aerial Survey

has gone into service to speed up blasting schedules. The primary breaker at the new crushing plant is an Allis-Chalmers 42-in. gyratory which will reduce stone to minus 6-in., followed by two Pennsylvania Impactors which will crush to minus 1-in. Surge piles between crushers and the loading station will be served by Robins belt-conveyors. The storage pile of finished stone has a tunnel reclaiming conveyor which will load the cars. Hewitt-Robins vibrating screens will scalp oversize between the crushing units in closed circuit. The company-owned railroad, with 70-ton diesel locomotives pulling the cars delivers the stone to the plant. Formerly the crushing was done at the plant.

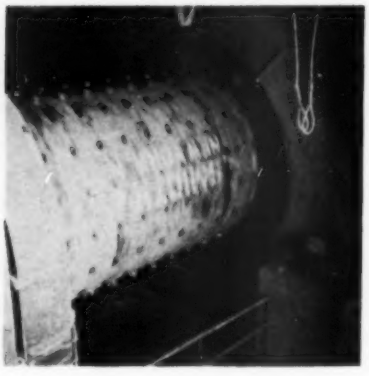
The Victorville plant is a wet-process operation and gains in raw- and finish-grinding capacity to match the increased burning output have been accomplished in an interesting, efficient and economical manner. On the raw side, four 7- by 26-ft. Compeb mills and an 8- by 40-ft. 3-compartment mill formerly handled the grinding in open circuit. Now only four of the mills are employed, but total grinding capacity is now at least 20 percent greater than when the five mills were operated! This has been effected by closed-circuiting each of the four mills with 20-in. Centriclones. These wet-cyclone classifiers return oversize to the mills, delivering the finely-ground slurry direct to storage. This method enabled the mills to expend their entire effort in grinding oversize-particle material and accounts for the tremendous gain in capacity, as high as 50 percent greater per mill, as compared with the conventional open-circuit grinding formerly employed.

These five kilns, each 10 by 350 ft. in size, were installed at Riverside's Oro Grande plant within the last five years.



Left: Dust from the five kilns at Oro Grande is handled by this bank of combination multiple cyclone electrical precipitator units.

Below: One of the air-swept ball-mills in the Oro Grande mill building. Units of the same type are used for raw grinding, as well as for first-stage grinding on the finish side.



With the Centriclones in the circuit, tramp oversize in the kiln feed in the 20- to 50-mesh range has been largely eliminated, the maximum particle size seldom exceeding 65-mesh. Other advantages include the obvious one of less over-grinding of fines, as lower unit power cost. A Hummer screen precedes each Centriclone, and moisture content of the slurry is in the range of 35 to 36 per cent.

On the finish end, the 7- by 26-ft. mill formerly used on the raw side has been adapted for clinker grinding, and a new Allis-Chalmers 10½- by 16-ft. tube-mill has been added to attain the necessary increase in grinding capacity. Clinker is screened, crushed by a pair of Traylor 36-in. TY crushers, followed by a 9- by 10-ft. Preliminator which feeds a 10-mesh product to the four tube-mills. Mills are equipped with Sturtevant air separators which bleed to Norblo collectors. Motors and mills are separated by a partition wall in the mill building.

The kiln and cooler installation is interesting, in view of the space limitations which dictated the choice of placing the Smidth 10½- by 330-ft. kiln in a position opposite that of the five other kilns which are arranged in parallel line-up with common feed and discharge ends. The new No. 7 kiln being installed this year, also a Smidth 10½- by 330-ft. unit, is alongside and identical in every respect with the No. 6 kiln erected in 1950. Thus, all kilns now have a common burning floor, but slurry feed tanks and appurtenant equipment for the five old 220-ft. kilns and the two new 330-ft. kilns are widely separated, about 800 ft. apart.

The five older kilns were served by

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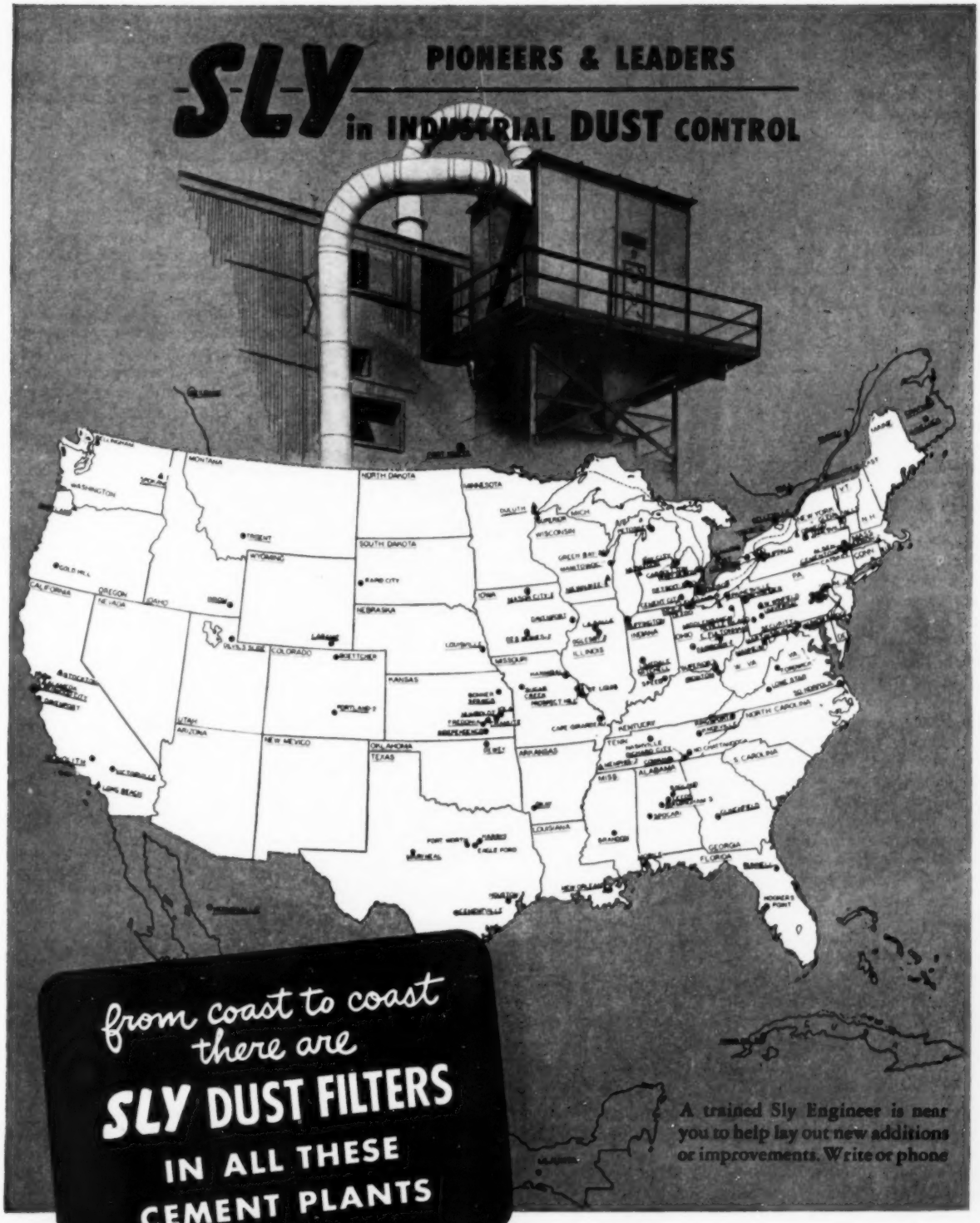

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rotary clinker coolers arranged in line with the kilns. When No. 6 kiln was installed, both it and the old No. 1 kiln which it faced were equipped with Fuller grate coolers, which required no more space than the one old rotary cooler extension on the No. 1 kiln. Likewise, when the new No. 7 kiln is installed this year with its No. 633 Fuller cooler, the rotary cooler on the old No. 2 kiln will be removed and replaced with a No. 525 Fuller grate-type unit. All seven kilns are equipped with chains.

Other improvements contemplated include additional slurry storage and blending capacity, and finish-cement silos. The plant grounds are currently being landscaped to provide pleasant surroundings for the modern office building, the new changehouse and locker-rooms, and a co-ordinated system of driveways and parking areas. Communication between quarry and plant is maintained by two-way Motorola radio.

The Southwestern company also has plants at El Paso, Texas, and Fairborn, Ohio. A few years ago an attractive new general office building was erected on Wilshire Boulevard in Los Angeles to house the principal administrative activities.

Riverside Cement Co. Largest producer in the southern California area is the Riverside Cement Company, which through a continuing program of expansion and improvement has attained a capacity of approximately 8,500,000 bbl. annually at its Crestmore and Oro Grande plants. General plant modernization and a new raw-grinding department are currently being engineered for Crestmore; however, the greatest advances capacity-wise have been recorded at Oro Grande, where within the last five years five new Smidth 10- by 350-ft. kilns have been installed and have gone into service. This is reported to be the largest battery of long dry-process kilns in the industry.

A detailed report of the program was published when three of these kilns became operative.* Last year the fourth and fifth of the 350-ft. all-welded units were added. At the same time the dust-collecting system — a combined Multiclone-Cottrell precipitator installation supplied by Western Precipitation Corporation— was extended to handle the two new kilns.

Each of the five kilns is equipped with a No. 520 Fuller inclined-grate cooler. These units serve primarily as recuperators, returning heat to the kilns at about 1,600 deg. F. in the form of secondary air. Clinker breakers are being added at the discharge ends of the Fuller recuperators. Clinker conveying is effected by a Skipulter and a pivoted bucket carrier system operating between the recuperators and the clinker storage. Capacity of the storage area has likewise been increased by deepening the area. Small Multiclone collectors are currently being installed on each of the five recuperator stacks to recover clinker fines formerly exhausted into the atmosphere.

New gypsum receiving and storage facilities have also been added in recent months. A below-ground pit can accommodate six cars of gypsum, recovery being *via* reciprocating feeders to a Hewitt-Robins belt-conveyor system running through the tunnel and up to storage bins.

Wagon drills in the quarry have been replaced with a modern heavy-duty Joy Champion 6¼-in. blast-hole drill. Quarry trucks equipped with Hydrotarders to control the speed of the loaded trucks on the downgrade from quarry to plant, deliver to the crushing plant, which has remained essentially unchanged since it was described in the previous article. An Allis-Chalmers 48- by 60-in. jaw crusher makes the initial breakage, followed by a Symons 5½-ft. standard and two 4-ft. shorthead cone crushers.

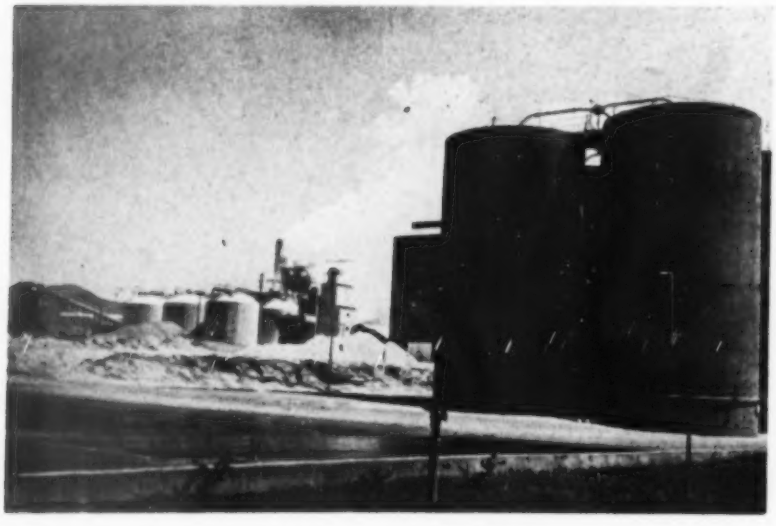
The raw- and finish-grinding departments have also been enlarged to match kiln capacity. Six single-stage air-swept Tirax mills, closed-circuited with separators, now do the raw grinding; before the two kilns were added last year, four of the air-swept units handled raw-grinding requirements. First-stage grinding on the finish end continues to be handled by Marcy and Tirax ball-mills. One additional air-swept Tirax mill was installed last year. Second-stage grinding capacity has been approximately doubled since the plant was last visited in 1948, four Allis-Chalmers 7- by 30-ft. tube-mills now performing this task.

Raw-blending facilities have been enlarged to a capacity of approximately 13,000 tons and consist of both reinforced-concrete silos and steel pressure tanks interconnected.

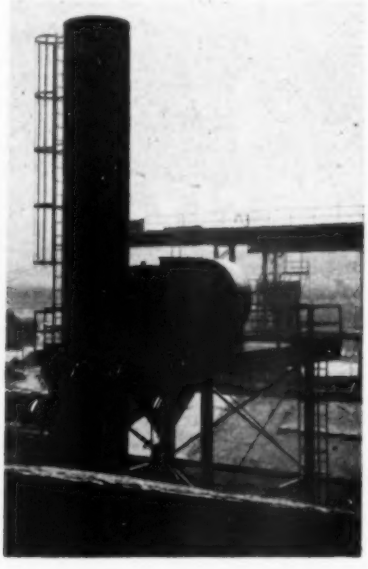
(*Continued on page* 143.)

*Pit and Quarry, July, 1948, page 86.

This view at Oro Grande shows some of the new finished-cement silos (right) and steel pressure tanks for raw dry blending (background). New gypsum receiving facilities are located below the piles near the center of the picture.



The collector installed on the cooler stack from one of the kilns. All five stacks at Oro Grande are to be similarly equipped to recover clinker fines formerly exhausted into atmosphere.



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Removal Of Rotary Kiln Rings

By WILLIAM G. DAVIS
Special Representative,
Remington Arms Company, Inc.

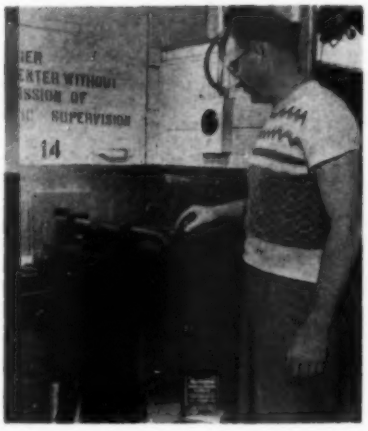
THE rings which form in rotary kilns have cost and are costing cement, lime, refractory, and light-weight aggregate plants many hundreds of thousands of dollars annually as a result of lost production.

It certainly should seem as if, over the many years that rotary kilns have been in operation, the causes of rings should have been found. In discussions with the operating personnel of over a hundred plants in this country, at least 22 basic reasons for these formations were given:

1. Changing conditions of fuel, including irregular firing
2. Changing conditions of combustion or draft
3. Variations in load materials in regard to volume (raw feed delivery)
4. Variations in load materials in regard to analysis or mix (material composition)
5. Intermittent service; lack of steady runs
6. Too much heat, which may cause fusing scale
7. Too little heat, which may cause stickiness
8. The human element; not watching kiln and instruments
9. Wrong type of lining in certain spots
10. Wear of kiln lining
11. Spalling or slogging away of kiln lining
12. Type of fuel; grade
13. Distance of flame
14. Spotty glazing or coating on lining
15. Wrong type of bonding material in lining kiln
16. Bringing kiln up to operating temperature too fast in cases involving a newly-laid lining or an old lining which has stood idle long enough to absorb considerable moisture from the atmosphere
17. Variations in rotation speed of kiln
18. Variations in size of materials (in some plants fines cause more rings)
19. Pushing production over kiln capacity
20. Inadequate coal grinding to suitable fineness
21. Flame nozzle or end partially burned away
22. Wrong length to diameter ratio of kiln

When it is considered that a combination of any two or more of these basic causes may result in a ring, it can be proven mathematically that there are over 17,000 possible causes for ring formations!

There are three general types of rings, variously known as nose, coal, or cold rings; clinker, fire, ash, or kiln rings; and mud, or chain rings. The consistency of these rings runs all the way from mushy to exceedingly hard, and it is rare that any two successive rings are of the same consistency. Add the factor that clinker rings may form anywhere from 10 to 90 ft. from the discharge end, nose rings may form from 3 to 15 ft. from the discharge end, and mud rings may form either in the chain section or just ahead of the chain section in wet-process kilns, and the difficulty of preventing rings can readily be seen.



An industrial gun of the type used for shooting kiln rings. The mounting shown here is the bolster or bracket type, which facilitates placing shot after shot exactly where desired.

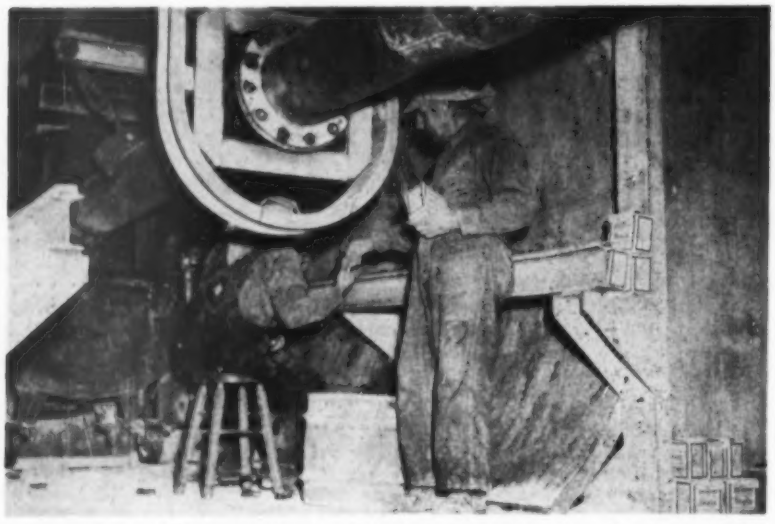
In 1951 one plant estimated that it had lost over $625,000 worth of production as a result of rings, while another plant figured its loss at $126,000. A study of the 1951 records of one plant showed that rings had been shot in at least one of its kilns 335 days during that year. Some plants report that it is necessary to remove or reduce rings almost daily, while others have reported no serious ring formations for some years.

Why can't rings be prevented? With over 17,000 reasons for rings, and particularly because of the urgency of removing them promptly, the operating personnel normally cannot afford the time to analyze and correct the cause. When a ring forms, production is progressively reduced; and with production being pushed as it is today, the loss is serious.

When a clinker ring forms, its length along the lining cannot easily be ascertained. At times the ring may be of the peak type; again, it may be a tapering ring, running many feet along the lining.

It has been ascertained that there are at least 15 methods currently being used to remove or reduce rings:

1. Shifting the burner closer to the ring
2. Re-aiming the flame (burner positioning)



A two-man crew shooting a ring in a lime kiln. An average of about 200 shells is required to remove a clinker ring in this type of kiln.

3. Shooting with compressed air
4. Stopping the kiln at intervals, cooling and shrinking the ring until it breaks or until particles wedge between the lining and the ring and pry it off
5. Using carbon dioxide bombs inserted through the kiln shell
6. Scraping or boring with long heavy water-cooled boring bars
7. Using steam or water lances
8. Melting down with increased fuel and temperature
9. Employing strong reducing or oxidizing conditions for short alternate periods
10. Manually punching out the rings with bars when their position is close enough; that is, using poke and boring bars
11. Cooling off the kiln entirely so that the cooled ring can be removed or reduced manually with air drills or hammers
12. Changing the kiln draft drastically for short periods
13. Using a gas jet
14. Using small but powerful streams or jets of water
15. Shooting with industrial guns and shells.

An analysis of the cost of removing rings by each of the above methods conclusively proves that shooting the rings by the use of industrial guns and shells is the most efficient and least costly method. Shooting rings means no extended kiln down-time and therefore (1) little loss of heat, (2) no loss of clinker, (3) little lost production, (4) little direct labor loss, and (5) minimum cost of equipment, *i.e.*, industrial gun and shells.

How many industrial shells would it take and how long is the flame off? Records show that as few as eight shells have been used, but that as many as 3,000 shells have been used for a very difficult hard nose ring. The average number of shells used to remove clinker rings in cement kilns is slightly under 300; in lime kilns, approximately 200 shells. No average can be arrived at for refractory and light-aggregate plants due to the variations in the raw materials used.

The industrial gun is normally fired from a bolster or bracket which is attached to the nose of the kiln, although some plants mount the gun on a tripod with a seat for the comfort of the shooter. The mount permits the gun to be moved in all directions while still making it possible to put shot after shot exactly where desired. The industrial gun is quickly and easily prepared for operation. In the majority of plants it is the practice to mount the gun, turn off the flame, stop the revolution of the kiln,

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Cutaway shows Norblo basic unit of 78 bags. Automatic shaking and bag cleaning, one unit at a time, insures full use of cloth area better than 99% of the time.

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and start shooting. Because the gun can be mounted, ready for shooting, in such a short time, and because at least 30 shots per minute can be fired, kiln down-time is reduced to the minimum.

While no average time can be established, rings have been shot out with as little as six minutes' loss of production and practically no loss of heat. Picture the length of time required when any other method is used, and it can be seen why the use of industrial guns and shells is increasing so tremendously. An experienced shooter knows where to place his shots so that a keyway is quickly cut through the ring. In most cases, turning over the kiln will cause the remainder of the ring to drop. If this does not occur, a few well-placed shots will cause it to drop.

In 1924 a cement plant superintendent who was an ardent hunter conceived the idea of shooting out a ring with a sporting rifle. From this idea was born the modern industrial gun and shells. The largest size of gun manufactured at that time was the 8-gauge shotgun. Remington Arms Company, known then as the Remington-U.M.C. (Union Metallic Cartridge) Company, redesigned its 8-gauge shotgun and placed it on the market as the Remington Kiln Gun. The Remington 8-gauge kiln gun shell, because of its stepped-up velocity and chamber pressure, was reinforced at the rim so that it could not be used in any standard 8-gauge sporting gun. While the shell today is known as an 8-gauge shell, it is slightly larger than 8-gauge at the neck.

The present rugged and efficient industrial gun was developed just prior to World War II but was not placed on the market until November, 1945. Built like a piece of artillery, weighing 92 pounds, it stands up under the most severe kiln room and plant conditions. The mount weighs 84 lb. As the muzzle of the gun is placed inside the nose of the kiln, it must stand the intense heat generated. It must not vibrate, or shot after shot cannot be placed in the desired position. It must be safe and hazard-free. To answer these requirements, the firing pin is presented transversely to the primer of the industrial shell; there is a primary extractor plus an ejector; a counter recoil spring as well as a recoil spring; a mortized breech block; a loading platform; and a transverse gear, plus other mechanical features. It requires but two motions to operate the action. By lanyard firing—instead of firing by a finger on the trigger—and proof-testing at the plant (as evidenced by the proof mark), plus the above features, safety has been built into the present industrial gun.

The standard 8-gauge industrial shells have a 3-ounce slug or projectile which develops a muzzle velocity of more than 1,600 f.p.s., equivalent to 18 miles a minute. This projectile has a muzzle energy of 7,475 foot-pounds or approximately 3½ foot-tons. The effect of this projectile, because of its tremendous power and speed of operation, can be compared to the smashing blow of many sledge hammers or power drills used simultaneously.

Lead is preferable to many other materials as it does not damage the kiln lining or coating; it mushrooms with tremendous force; it reduces ricocheting; and it does not contaminate the product as it volitalizes under the kiln heat.

One plant reported that it had reduced its kiln down-time for removing rings from 42 hours every three weeks, plus the complete scrapping of the material in the kiln at the time, to approximately 2½ hours for the same period, with no scrap or loss

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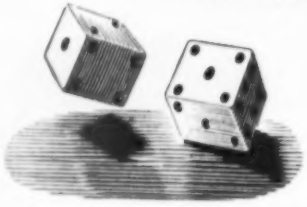
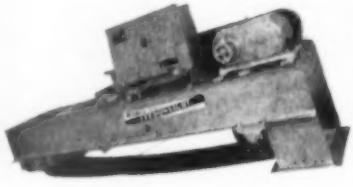
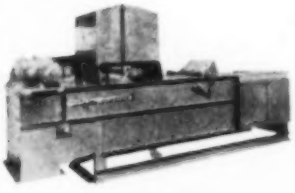
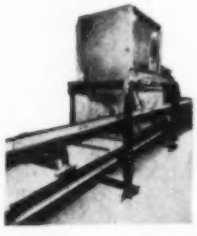


Cement Plants throughout the world are obtaining greater uniformity of blend — and consequent better Resultant END Product — through the use of Merrick Feedoweights*. Proper proportioning, continuously and automatically, of such materials as Clinker, Gypsum, Limestone, Shale, etc., assure uniformity of product quality.





For the continuous and automatic weighing of raw materials from Quarry, Ship or RR Car to Storage, or for the weighing of finished product to Storage and cars, Merrick makes the Weightometer*. Either self-contained or for use with an existing belt conveyor.



*Reg. U.S. Patent Office

Write for Bulletins 375, 643 and 253

MERRICK SCALE MFG. CO.
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of clinker. Another plant, formerly using a water and poke bar, reduced its down-time per ring from 8 hours to approximately 15 minutes.

The tremendous saving in kiln down-time is not the only factor which must be considered. The loss of heat under many of the older methods of removing rings means that several hours are often required to bring the heat up to the required degree. Some of the other methods spall the lining or knock off the coating and therefore make it necessary to reline the kiln at frequent intervals.

In some plants balls form in the fire and cooling zones. These rapidly grow until they damage the lining or become too large to go through the screens to the coolers. A few well-aimed shots cause the balls to break and distintegrate. In other kilns balls have formed too close to the nose of the kiln to permit the use of the industrial gun. In such rare cases they often can be broken up by shooting them with a Remington 12-gauge rifled slug fired from an ordinary 12-gauge shotgun. One plant has successfully broken up very hard balls which form close to the kiln nose with a Remington 30/06 caliber 180-grain, bronze-point bullet, fired from a standard 30/06 caliber rifle.

A number of mines and quarries are profitably using the industrial gun and shells for scaling their ceilings, walls, or faces. The removal of protruding rocks, ice, or other obstructions at inaccessible points by the use of the industrial gun saves many hours of hazardous work. To do this, the projectiles are fired so as to strike at the point where the obstruction protrudes from the face, wall, or ceiling.

There is no mystery as to the causes of rings which form in rotary kilns; but the thousands of conditions which can cause these rings, plus the urgency of their removal, will continue to plague plant and operating personnel and cost their companies many barrels or tons of lost production. The expense of eliminating or preventing rings by various mechanisms is usually much higher than the cost of removing them with industrial guns and shells.

S. California Plants

(*From page* 138.)

The tanks have porous bottoms to facilitate aeration and homogenizing of the raw mix, utilizing air at low pressure. In the compressor house, a new Ingersoll-Rand 12,500 c.f.m. low-pressure compressor driven by a 1,000-hp. motor was recently added

10 REASONS WHY

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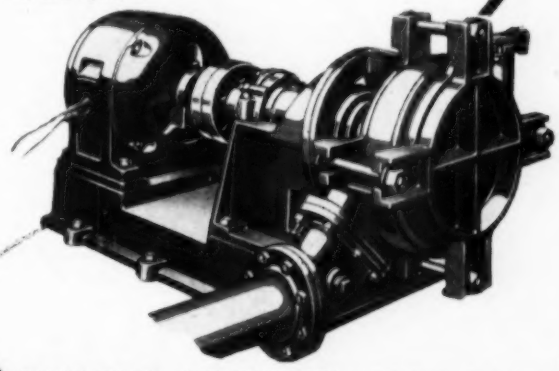
4. **MAXIMUM LIFE OF WEARING PARTS** — Because the alloy is selected to suit the job — because Morris' pumps are applied to give low velocities through impeller and casing — because Morris pumps operate at low speeds.



5. **HEAVY SHAFT AND BEARINGS** — Eliminate dangerous vibration due to any abnormal operating conditions — long and satisfactory bearing life.
6. **EASY TO REPAIR** — Only four bolts need be loosened to renew impeller and shaft sleeve — not necessary to disturb piping.
7. **SAVES POWER** — In many instances able to move more material per KW.
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9. **FLEXIBLE PERFORMANCE** — Operates satisfactorily under high positive heads or, if necessary, under a vacuum through moderately long suction lines.
10. **SAVES PIPING EXPENSE AND FLOOR SPACE** — Because the Morris Type "R" allows 72 different combinations of suction and discharge nozzle positions.

For long term efficiency — and economy . . . for simplified assembly and disassembly — and a minimum of shutdowns . . . specify Morris Type "R" Pump. Free consultation with a Morris engineer at your request.

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Finished-cement storage has been increased by the recent erection of a bank of eight silos with a capacity of 15,000 bbl. each. Grounds are being attractively landscaped, a new, 5,500 sq. ft. changehouse is under construction.

The Oro Grande plant personnel is proud of its safety achievements, having won the Portland Cement Association trophy three times for operating a full calendar year without a lost-time accident. When visited early in May, 1953, the posted record showed 500 consecutive days' operation without a disabling mishap!

California Portland Cement Company A continuing program of development and expansion at the largest plant in the area, that of the California Portland Cement Company at Colton, Calif., has increased capacity about 20 percent since the end of World War II, bringing the present figure in excess of 5,000,000 bbl. annually. The Colton plant recently added a new crushing department, new dust-collecting equipment, and other improvements designed to raise output and step up operating efficiency. A second kiln was added at the company's subsidiary operation, that of the Arizona Portland Cement Company at Rillito, Ariz., a little over a year ago to double capacity there. Much of Arizona's cement came from southern California until the Rillito plant was built. This facility, still the only plant in Arizona, has greatly eased demands on the southern California mills.

Monolith Portland Cement Company Planned improvements at the Monolith Portland Cement Company's plant at Monolith, Calif., suffered a severe set-back less than a year ago, when the plant was damaged by the heavy Tehachapi earthquake, which had its epicenter just a few miles from the plant. Expansion plans had to be shelved until repairs and rebuilding could be carried out. Currently, however, the company is preparing to increase burning capacity, either by adding a drying section ahead of its 285-ft. No. 5 kiln, or by installing a complete new and longer kiln. Raw- and finish-grinding capacity is more than ample to handle present clinker capacity, which is nearly 3,000,000 bbl. annually; and the improvements, together with the development of a more effective control pattern, should step up output an additional 750,000 bbl. annually.

Most recent improvements at Monolith involved the expansion of the finish end through the installation of a company-designed friction-driven 8- by 42-ft. semi-air-swept compartment mill with in-series Multiclone collectors. About the same time, novel clinker coolers consisting of hollow-flight water-cooled screws were placed in service to improve grindability and lower the temperature of the finished cement.

Blue Diamond Corporation For a number of years, the Blue Diamond Corporation has operated a finish-grinding mill near downtown Los Angeles, using surplus clinker from some of the producing plants mentioned above. The company reports capacity at about 600,000 bbl. annually. Much of the output is used by Blue Diamond itself in its ready-mix plants.

A sizable increase in sales and net profit over totals in 1951 were reported for the Georgia Marble Company, Tate, Ga., in 1952. According to the annual report, the firm's net profit for 1952 was $323,546 on sales of $4,491,513, as compared with $302,662 on sales of $3,595,870 in 1951. President J. R. Cowan stated that 30 percent of sales were accounted for by the calcium products division, 15 percent by the Alabama Limestone Company (acquired in 1951), and 55 percent by dimension stone.

Airalon is an air entraining agent and plasticizer specially formulated for masonry cement.

Economical—Airalon enables the cement maker to produce his present quality cement *at lower cost* . . . or to produce a higher quality cement at no increase in cost.

Ready-to-Use—Airalon contains, in one easy-to-handle compound, the saponified resin acids and fatty acids needed to make a high quality masonry cement. Airalon is added at the cement mill as received, in liquid form, which simplifies inventory, handling and storage. Also available as a pourable, water-soluble dry powder.

Proven and Approved—Airalon has been exhaustively tested in our own laboratories and in extended commercial grinds . . . it is also suitable for intergrinding with air entraining cement and is accepted by ASTM under Cement Specification C175-48T.

DA **DEWEY and ALMY Chemical Company**

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April, 4-Month Totals Show Substantial Gains Over '52 Building Figures

The construction boom broadened its base in April, for aiming at a 1953 total equalling or exceeding the all-time high of 1952.

The four-month Dodge total of $5,186,238,000 is 10 percent above the corresponding total for 1952. The three-month total was 11 percent above that of 1952.

It may be noted that if the Dodge total should slip the same amount in each of the remaining eight months, 1953 would still be ahead of 1952 at the end of the year.

Nonresidential was the strongest classification of Dodge reports in April. The total was $680,330,000, up 51 percent over March, 1953, and up 21 percent over April, 1952. Residential award reports totalled $673,887,000, up 11 percent above March, 1953, but 1 percent behind April, 1952. Heavy engineering and public works and utilities totals were $387,325,000, up 32 percent over March, 1953, and up 10 percent over April, 1952.

The grand total of Dodge reports in April was $1,741,542,000, up 29 percent over March, 1953, and up 9 percent over April, 1952.

All categories showed gains for the four months: nonresidential, $1,910,740,000, up 13 percent; residential, $2,157,691,000, up 7 percent; heavy engineering, $1,117,807,000, up 10 percent —as compared with the first four months of 1952.

Mineral Identification Simplified by New Book

Tests, methods, and charts are included in this 420-page book to assist in the identification of minerals. The book, *Identification and Qualitative Chemical Analysis of Minerals*, was written by Orsino C. Smith, who is superintendent of the Vinvale Refinery of the Richfield Oil Corporation, vice-president of the Pacific Mineral Society, and past president of the Los Angeles Mineralogical Society.

The chapters in the book cover such subjects as: Physical Properties; History and Uses of Blowpiping; Blowpipe Reactions; Ultra-Violet Light and Fluorochemistry; Mineral Chemistry; and tables of tests, reactions, and identifications.

The book is published by D. Van Nostrand Company, 250 Fourth Avenue, New York, N. Y. and sells for $7.50 per copy.

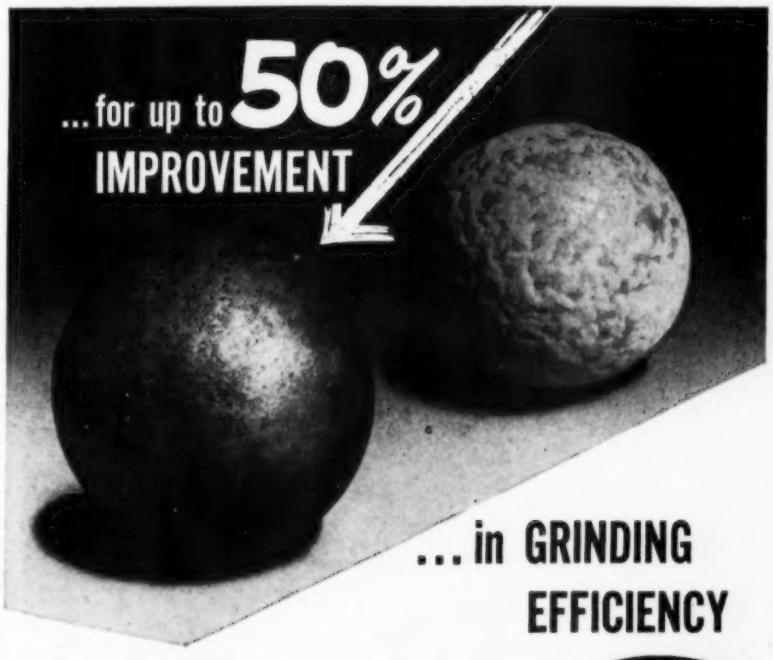
Strategic Waters Purified By Army Corps of Engineers

Some of the nation's most strategic waters, partially contaminated by industrial and domestic waste, are receiving purification treatment from a mobile water purification unit developed by the Army Corps of Engineers' Research and Development Laboratories, Fort Belvoir, Va.

The ten-week itinerary includes stops at Laketown, Utah; Fort Knox, Ky.; and Rock Island, Peoria, Springfield, and Cairo, all in Illinois. The waters scheduled for testing are Bear Lake, Lake Springfield, the Mississippi, Illinois, Ohio, and combined Mississippi, Missouri and Ohio rivers. The sites selected for service testing the equipment will answer many of the Army's questions not previously answered during the engineering tests. Mile-high Bear Lake was chosen to test the operation of the unit at high altitude. The Illinois locations will give the Engineers a pretty good idea of how the unit will operate during a typical Midwest winter. At Fort Knox the purifier will go through its paces over rough and rugged terrain.

The mobile water purification unit is truck-mounted and electrically operated. It will treat, clarify, filter and distribute 3,000 gallons of water an hour in temperatures as low as 40 degrees below zero. After polluted water is pumped in it takes about 20 minutes before drinking water is discharged. One man is required to operate the unit and three can put it into operation in less than 90 minutes.

The highest quarterly total in sales in the history of the National Gypsum Company — $27,789,568 — was chalked up during the January-March period of this year. Earnings during this period were $1,878,529. For the first quarter in 1952 the corresponding figures were $21,847,294 and $1,629,629, respectively.



keep grinding mill balls clean with TDA

There's a big difference between these two identical steel grinding mill balls . . . taken from the same grinding mill. And the difference is TDA catalyzing grinding aid. The coated ball was used *without* TDA. The ball that's uncoated, still in perfect shape to do a good grinding job, was removed from the mill 24 hours *after* the introduction of TDA.

With TDA, you get top performance out of your mill. TDA increases grinding rates of Type 1 cement 15 to 20%, of Type 2 cement 20 to 25%, of Type 3 cement 25 to 50%. TDA gives you these increases, even in closed circuit grinding because the dry dispersing effect increases air separator efficiency.

TDA more than pays its own way. Its cost is amortized as you use it . . . and you use it only as you need it.

With modified TDA (MTDA) at a slightly higher price, you get still greater efficiency even under adverse conditions.

DA DEWEY and ALMY Chemical Company

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Metal Detector Proves Value At Kingston Trap Rock

● Looking into the surge pile tunnel: the metal column (center) surrounded by planking is the detector. On the wall (left) is the sensitivity control box which flashes a red light to show that there is metal on the conveyor. In the foreground is a large piece of scrap metal just removed.

Those dangerous and expensive "land mines" of the stone crushing industry —pieces of metal that get lost in the quarried rock and show up later to damage crushers or jam screens—are being effectively detected and removed from the conveyor feed belt at the Rocky Hill, N. J., quarry of the Kingston Trap Rock Company, since an R.C.A. metal detector has been installed.

Located on the feed belt of the secondary crusher just past the surge pile, the detector spots any metal that may be hidden in the stone and automatically stops the conveyor. A flashing red light and a siren horn warn the plant of the stoppage, so that the metal can be removed and the flow of stone resumed.

Although the detector has been used only a short time, it has more than paid for itself in the opinion of Kingston's maintenance chief, Henry Buron. In his 27 years on the job, Mr. Buron has seen much damage and many costly delays which resulted from undetected metal getting into crushers and screens. The electro-magnetic R.C.A. detector permits the removal of the scrap metal before it can do any damage, guaranteeing an uninterrupted production flow throughout the plant, he explains.

Housed in a hollow metal tubing that encircles the conveyor belt, the detector is controlled by a sensitivity control box that can be set to detect even the smallest piece of metal as the conveyor load flows through it. A medium sensitivity is sufficient to spot pieces large enough to be dangerous further on. In the fast-growing pile of scrap iron are beer cans, broken drill bits, dipper teeth, and mysterious huge chunks of metal.

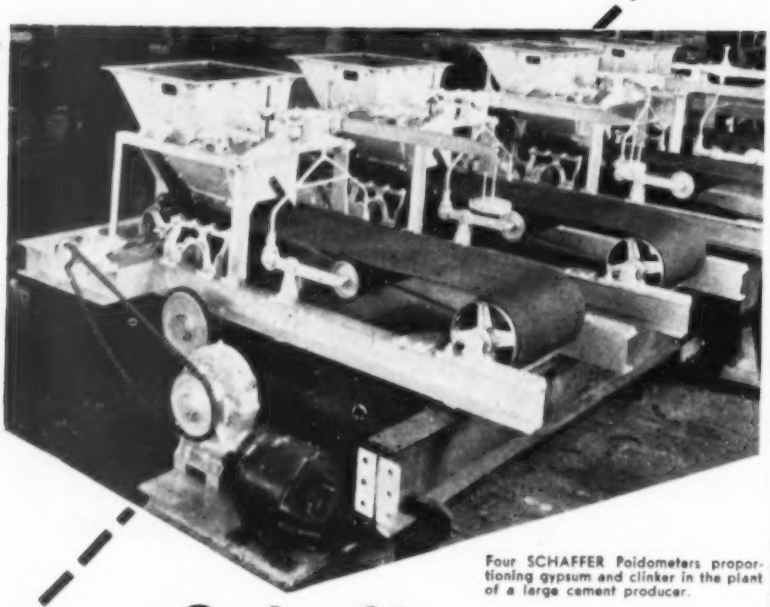
As installed at the Kingston quarry, the detector is fitted with a siren which is sounded whenever the belt stops, so that the workman who removes the metal need not fear missing its flashing red light. A wooden framework protects the detector from damage by stone on the belt. Two trough idlers, one in front and one behind the detector have been insulated to prevent shorting out the unit on the metal framework, while the metal decking under the belt has been replaced with wood and rubber padding for the same purpose.

● Some scrap detected by the device.

Accurate SCALES

...a "Must" in Modern

CEMENT PLANTS



Four SCHAFFER Poidometers proportioning gypsum and clinker in the plant of a large cement producer.

Schaffer POIDOMETERS

CEMENT is indispensable in building the modern world . . . high-precision scales are needed to insure peak quality of this product . . . and SCHAFFER Poidometers are unequalled in meeting every scaling requirement.

These super-performing units eliminate production "bottlenecks" in weighing, feeding, mixing, blending, recording, or proportioning raw and finished bulk materials.

Poidometers combine speed, accuracy, and automatic operation. They are engineered and constructed to provide long, trouble-free, economical service.

Available with total weight recorders, and with remote control devices for showing and changing feed rate.

Write for Catalog No. 5

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BIN Stuck Lately?

Stubborn materials move efficiently and economically through your bins, hoppers, chutes, screens and other material handling devices with the use of a CLEVELAND air vibrator.

Standard metallic impact and air-cushioned, quiet types available in a wide range of sizes. Engineering recommendations from us, at no charge, will assure you of the right type and size for your application.

Write us today for more data on the subject.

THE CLEVELAND VIBRATOR COMPANY

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TYPE F

TYPE VG

TYPE LSRR

TYPE UH

TYPE SA

HOW ALLIS-CHALMERS HELPS

Rotary Kilns

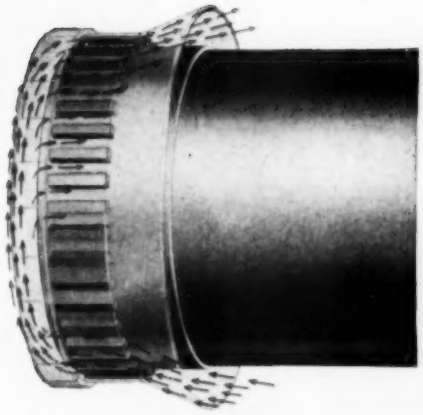
IF YOU'RE THINKING in terms of profits, it will pay you to consider the cost-cutting advantages of Allis-Chalmers rotary kilns and auxiliaries shown here. Improvements such as these will pay for themselves several times over in lower maintenance and production costs. Kilns now in service can be modernized with these profitable features.

A-4090

CEMENT PLANTS MODERNIZE

AIR-COOLED KILN END

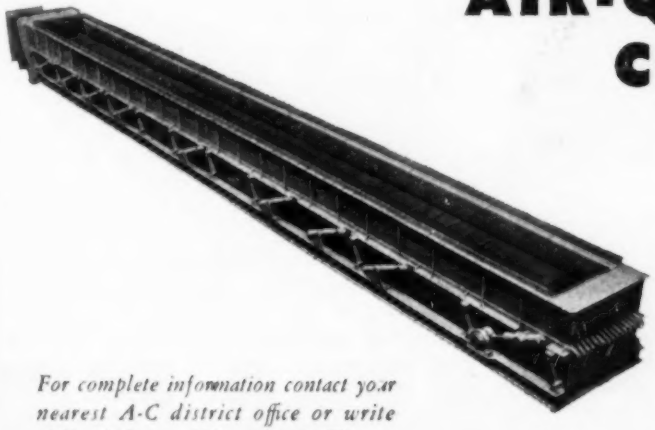
. . . Will pay for itself in 2 to 3 years, in refractory savings alone! You avoid loss of valuable production time because fewer shutdowns are necessary to replace end brick. This results, too, in savings on brick and labor. And — an air-cooled kiln end makes possible a positive air seal between the firing hood and the kiln, resulting in fuel savings. The temperature of the air inside the kiln is not decreased by infiltering cold air.



MOVABLE FIRING HOOD

. . . Can be easily adjusted to compensate for expansion and contraction of kiln. Maintains a good air seal with kiln, keeping cool air out and reducing hot air loss at kiln end. Allis-Chalmers firing hoods are designed to use standard refractory brick lining and have access and inspection openings. They're built heavily, to stay round and rigid, even after years of service.

AIR-QUENCHING COOLER



. . . Results in maximum rotary kiln economy and fuel utilization. The air-quenching cooler is designed to isolate and capture the hottest secondary air above the cooling clinker and return it to the kiln. True air-quenching of clinker results in reduced grinding costs because clinker is cooled rapidly (by an upblast of cooling air) not gradually. Installation, power and maintenance costs are less than with any comparable cooler.

For complete information contact your nearest A-C district office or write Allis-Chalmers, Milwaukee 1, Wis.

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Want still finer feed

to Increase the Capacity of Tube Mills?

Year after Year
DEPENDABILITY with
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IMPACT HAMM
at . . .
DEWEY PORTLAND
. . . for over 25 y
MARQUETTE CE
. . . for over 23
IDAHO PORTL
. . . for over 2

more than
"Just Machinery"
Since
1885

Here's a GI
for Capacity
400 TONS PER HOUR
1/2 inch and minus
WRITE FOR INFORMATION

. . . Inquire about our Conventional *Breakers*
and Movable Breaker Plate Crushers for wet products

Complete Engineering Service on Crushing of Materials and Problems Related to Crushers

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CRUSHER *and* PULVERIZER CO., Dept. PQ 7 **ST. LOUIS 6, MO.**

KILN and COOLER CASTINGS

"SUFFER" from the HEAT

The calcining and cooling of kilned raw materials imposes consuming demands on castings from the feed pipe to the last hot grate or lifter. At Carondelet we have been making a thorough study of these conditions by working with many of the major producers endeavoring to find the most economical analysis of heat resistant steel or iron for each situation. Much has been accomplished and economies have been effected through the application of lower first cost materials giving comparable service life and higher first cost materials greatly lengthening service life. Premature cracking, scaling, warpage and growth are symptoms worthy of investigation. We should like to discuss any of these problems with you.

CARONDELET FOUNDRY COMPANY

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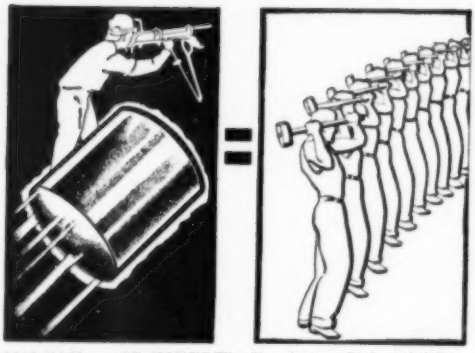
Do these jobs at lower cost:
• Remove rings in kilns.
• Remove protruding rocks.
• Scale walls and ceilings of quarries, mines and tunnels.

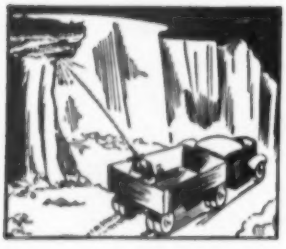
The Remington Industrial Gun will save you time and money!

especially designed for the cement and mining industries and lime refractories . . . the Remington Industrial Gun eliminates old-fashioned methods of removing rings! One man operates it . . . firing a few well-placed shots that loosen the ring and cause it to crumble when the kiln is rotated. There's no need to shut down the kiln and consume time cooling and reheating it.

For folder giving further information, write to Remington Arms Company, Inc., Bridgeport 2, Conn.



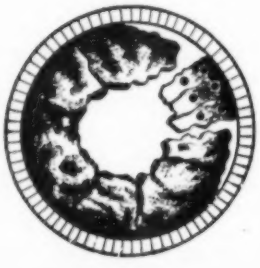
ONE MAN . . . OR MANY? The Remington Industrial Gun makes it possible for one man to destroy heavy obstructions that formerly required the time of several men working in restricted or hazardous positions.



The Remington Industrial Gun Has Many Uses

It's handy for scaling the ceilings and walls in mines. The illustration shows how the gun can be used to remove protruding rocks, ice and other obstructions at inaccessible points where conditions permit this kind of operation.

Remington Industrial Guns are leased—$200.00 the first year, $25.00 per year thereafter.



Cutting a "key way." A few well-placed shots will loosen a section of clinker . . . weaken the rest of the ring . . . usually cause it to fall when kiln is rotated.

Remington Industrial Shells are loaded with a powerful 3-ounce lead projectile that develops 7475 foot-pounds muzzle energy.

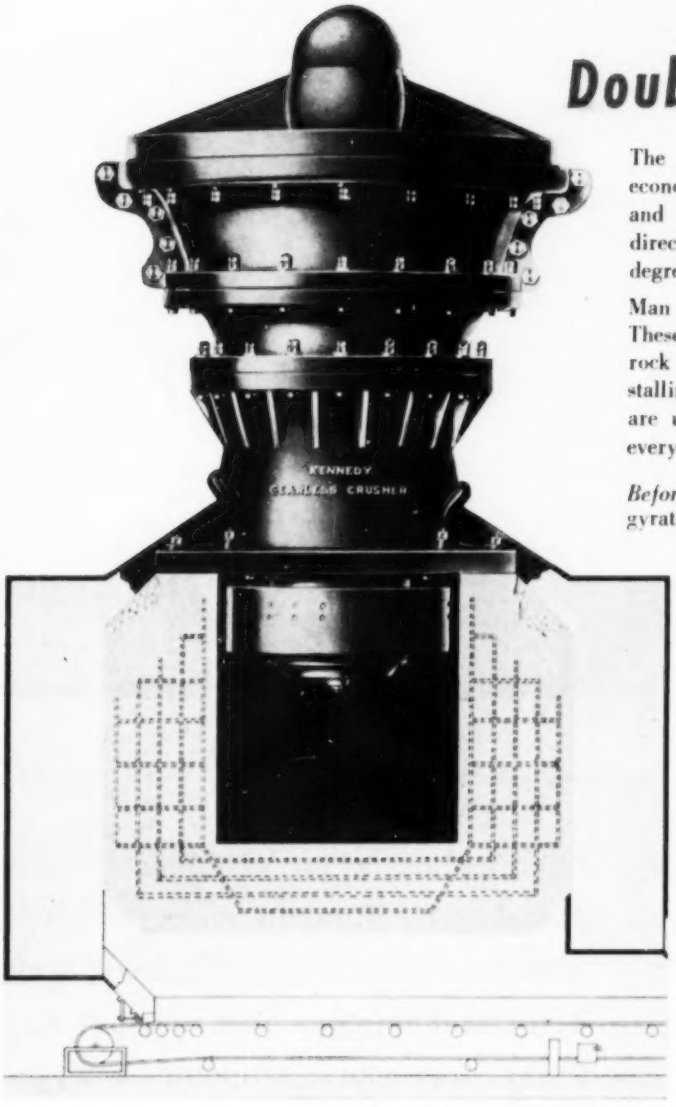
"If It's Remington—It's Right!"

Remington DUPONT

UNMATCHED ECONOMY OF OPERATION

with KENNEDY

Double Discharge Crusher!



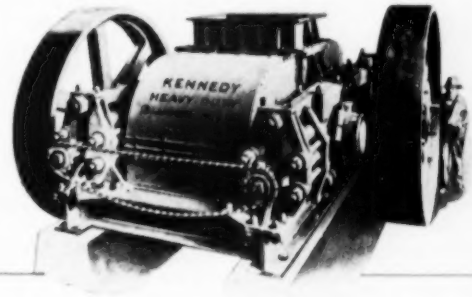
The new Kennedy double discharge crusher affords operating economies not found in any other type. In addition to established and rated power savings through its synchronized motor built directly into pulley assembly. Two discharge outlets set at 70 degree angle eliminate the sticky ore problem.

Man hours, lost in clearing clogged crushers, is done away with. These new design crushers handle slag, tachonite, hard-to-crush rock and ore with *as much as 50% clay*, without clogging or stalling. For peak capacities at low operating cost, KVS crushers are unmatched! Built in primary and secondary types to suit every crushing requirement.

Before you specify, get the facts about these new and better KVS gyratory crushers. They're TOPS!

KENNEDY SLUGGER ROLLS HAVE NO EQUAL FOR FINE PULVERIZING . . .

Wreck-proof, special purpose roll type Slugger Rolls, built to handle large capacities. Variable reduction from 2" to 10" readily made *while machine is in operation*. Saves time, increases production. Fly-wheel drive. Also made in single, special purpose rolls.



Send for full information today!

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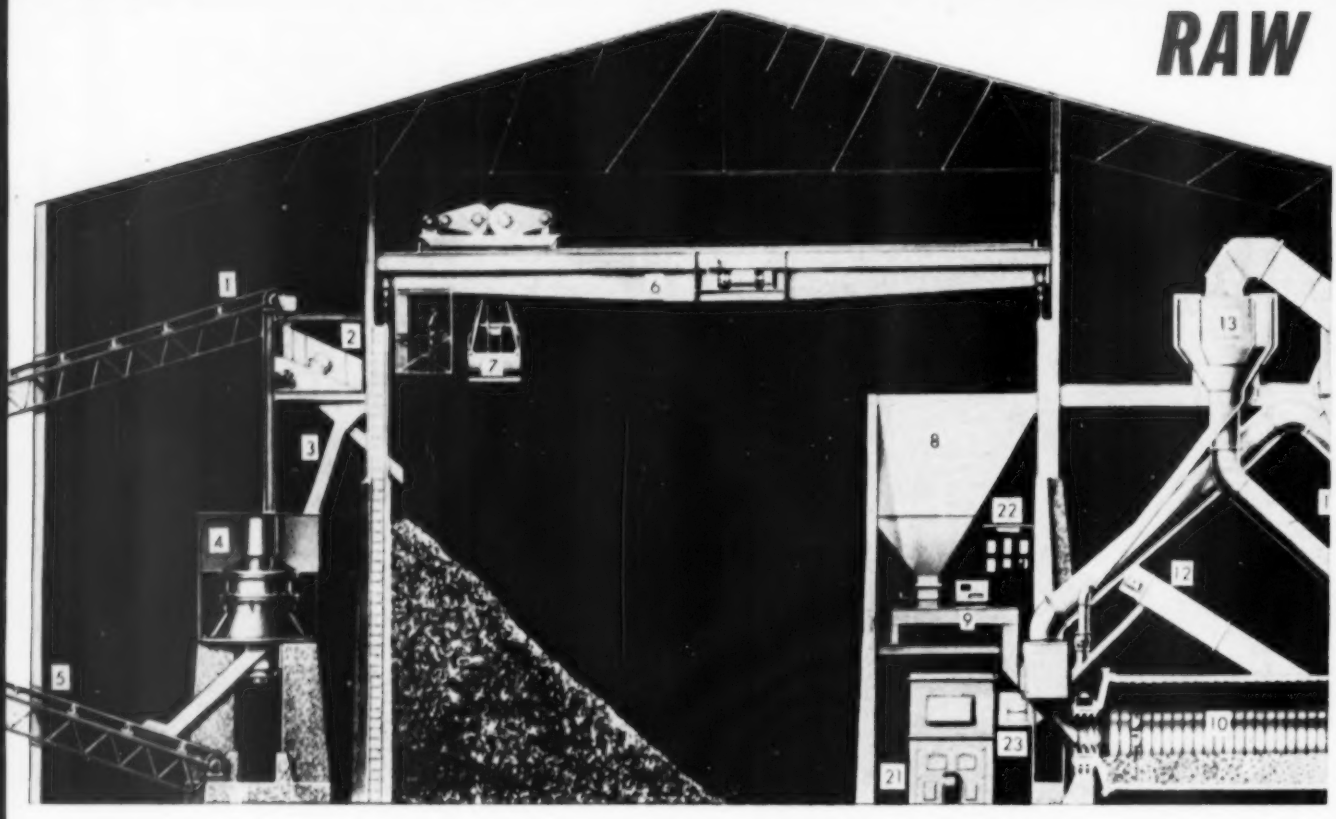
MANUFACTURING & ENGINEERING CORPORATION
TWO PARK AVENUE, NEW YORK
***FACTORY* DANVILLE, PA.**

KENNEDY STRATIFIED AIR

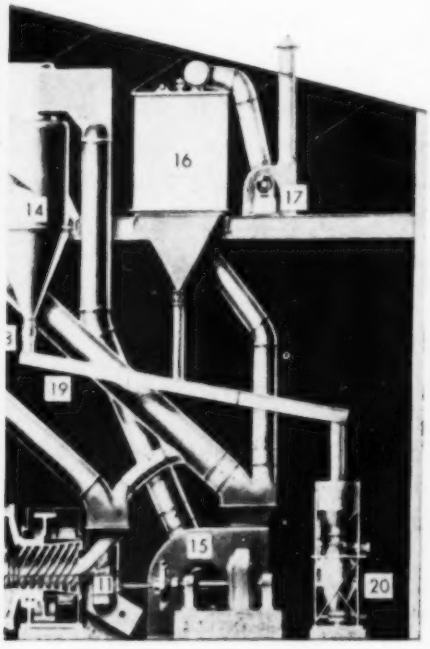


The Kennedy Stratified Air Swept Tube Mill System with dual classification grinds raw material having up to 20% moisture and also serves the threefold purpose of dryer, separator and grinding mill.

Over 100 tests show tube mill capacity **Increases of 29% to 52%** by use of dual classification when grinding clinker 2″ and finer. Marked economy of operation is effected in power consumption. Additional major savings are shown in fewer man-hours, minimum maintenance, a more uniform product and increased production. These savings alone will offset installation costs in four years or less!

SWEPT TUBE MILL SYSTEM...

STONE, ORE AND CLINKER GRINDING AT LOWER COST!



1. BELT CONVEYOR — FEED TO CRUSHER
2. GEARLESS GYRATORY CRUSHER
3. ELEVATOR
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5. OVERSIZE RETURN CHUTE
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9. WEIGHING FEEDER
10. STRATIFIED AIR SWEPT TUBE MILL
11. RADIAL FLOW CLASSIFIER
12. CYCLONE COLLECTOR
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14. DUST FILTER
15. DUST FILTER EXHAUSTER
16. ROTARY AIR LOCKS
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Send for blueprints and full operating data. The facts will impress you!

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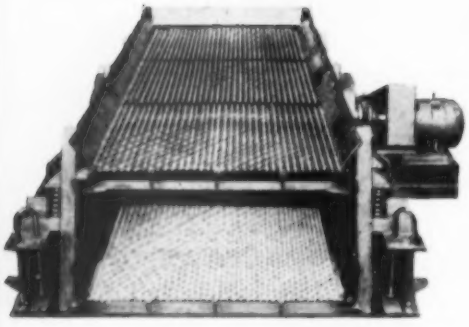
KENNEDY ROTARY KILNS, COOLERS, AND DRYERS TOP THE FIELD

..SECTIONALLY BUILT, ANY LENGTH OR DIAMETER.

World-famous for strength, durability and economical operation. Kennedy Kilns combine many exclusive construction details with the latest approved engineering features.

Gear reducers driven by variable speed motors permit rotation of kiln at any desired speed. Riding rings, internally cooled, are mounted on self-aligning bearings for frictionless service. Made in single or multiple units in all lengths and diameters. Noted for uniform production and continuous operation with an absolute minimum of wear or time lost for repairs and maintenance. Send for literature.



VIBRATING SCREENS

with one, two or three decks: Strong, efficient screens built for heavy duty sifting or a wide range of aggregates. Four-way vibrating motion handles all grades of rock and ore swiftly, effortlessly. Interchangeable mesh readily installed to accommodate any fineness of screening desired. Available in a range of widths and lengths, stationary or portable models.

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FARRELL-CHEEK STEEL CO.

MANUFACTURERS OF HIGHEST QUALITY ELECTRIC FURNACE CARBON AND ALLOY STEEL CASTINGS

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FARRELL'S 85 STEEL CASTINGS

CRANE WHEELS
Overhead, Gantry, Monorail, Ingot Car, Charging Machine.

ELEVATOR, CONVEYOR PARTS
Sprockets, Traction Wheels, Chains, Buckets, Rollers, Idlers, Bushings.

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Complete Line Wire Rope Fittings and Cutters, Bar Benders and Cutters.

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"True Tooth" Gears and Pinions, Sheaves and Wheels.

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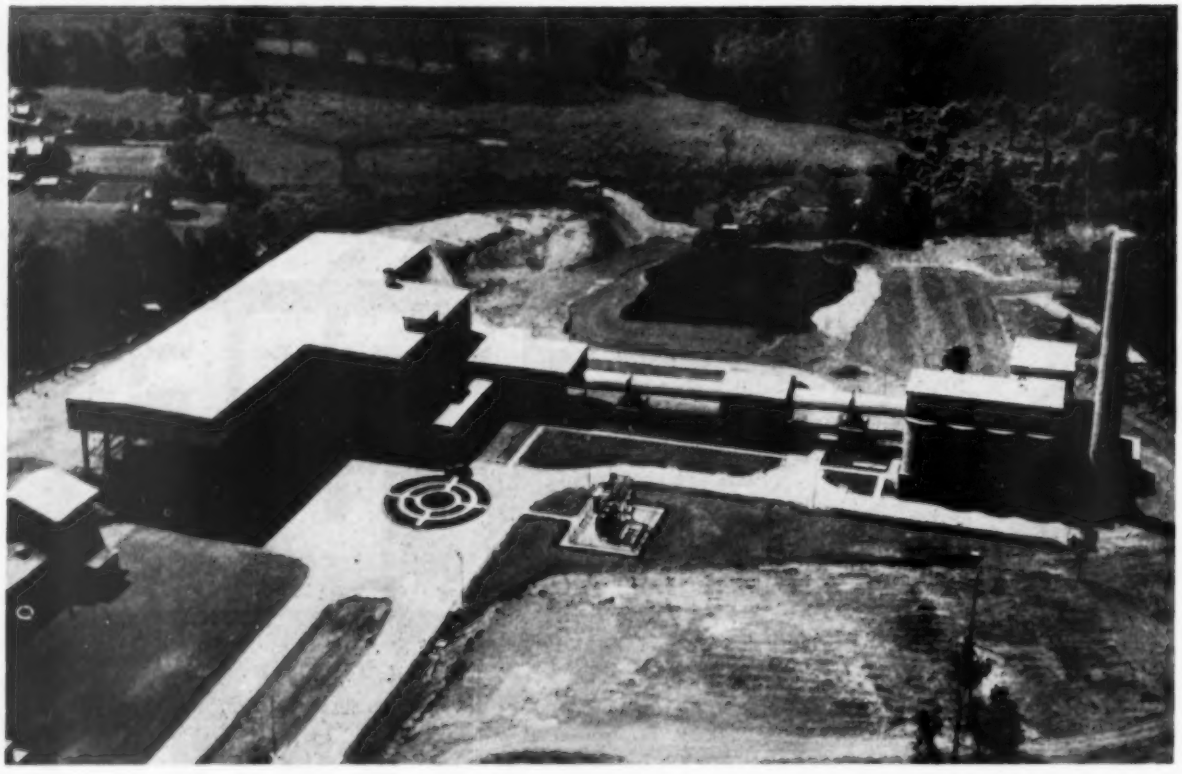
Locomotive and Car R. R. Specialty Castings.

STOKER PARTS
Feed Screws, Furnace Tools, Flanged Pipe, etc.

YOUR INQUIRY WILL PROMPTLY BRING DETAILED INFORMATION PERTAINING TO ANY OF THE ABOVE FARRELL-CHEEK PRODUCTS

SANDUSKY, OHIO

ALONG THE MOHAWK TRAIL



This model plant at Jamesville, N. Y. is attaining records in low cost production for small capacity plants at 2200 barrels per day and is a tribute to the Alpha organization. Modern design includes detailed attention to safety, cleanliness and pride in appearance. We are pleased to have been chosen to do the detail engineering design of this plant and to have charge of its erection.

For design and construction of your new plant or extensions, contact us at any of our offices

MACDONALD ENGINEERING CO.

Construction Engineers

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Toronto, Canada

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How many hundred dollars will this ad save you?

Both K-2 and K-4 links are shown at the left. When wide buckets are used, Kensington's special 4-hole K-4 makes it possible to use one strand instead of two . . . *and that single KENKROME chain will be stronger than two ordinary No. 844 chains!*

The Renewable Tooth Sprocket is another example of Kensington's improved design. Tooth segments can be replaced by two men during lunch hour . . . without even removing the chain! And a new set of teeth costs but a fraction of what you'd pay for a complete one-piece sprocket.

How much do you spend each year to replace elevator chains and sprockets?

Be sure to include the labor needed to make each change. And don't forget loss in production while your plant is shut down for repairs.

Now figure the money you'd save by using a chain that outlasts ordinary chains 2 to 4 times. That's what you can expect from the improved KENKROME No. 844 Heavy Duty Elevator Chain shown above!

KENKROME is no ordinary steel . . . in fact it's no ordinary manganese steel. There's no other steel quite like it.

Addition of special alloying metals under a patented process, plus Kensington's own scientific method of heat treatment, have created this remarkable metal which defies wear by developing surface hardness under impact to better enable it to withstand abrasion. Beneath this continually hardening surface, the metal always remains tough . . . better able to withstand shock than are metals that are hard all the way through.

But Kensington's wear-conquering engineers didn't stop with development of the metal itself. They redesigned the physical characteristics of the links. Note, for example, how the extra-heavy 1¼" pin is held in place. Even in those rare instances when a pin *does* break, it can't fall out, for on one end a cotter pin fits over its head, and on the other, a cotter pin passes through both pin and extended boss. Pins have T-head so they may be reversed. They fit link holes that are drifted to close tolerances. Links are extra heavy . . . heavier than in any other No. 844 built.

KENKROME Chains and Sprockets are built to fit all standard conveyors and elevators used in rock, gravel, and cement plants. It will pay YOU to *Switch to KENKROME!*

To find what it will cost, just fill in and mail the coupon. You'll be under no obligation.

Other wear-resisting alloyed ORO manganese replacement parts

Elevator buckets that last longer, seldom need replacing.

Crawler treads for all sizes and types of shovels and draglines.

Replacement parts for roll and jaw crushers, ball, rod, tube, hammer mills.

Crawler sprockets for most shovels and draglines.

Kensington STEEL COMPANY

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Chain Information
CHAIN NO. _____ TYPE _____ LENGTH _____
ATTACHMENT NO. (OR 2 BOLT PINS) _____ SPACED EVERY _____ PITCH

Sprocket Information
CHAIN NO. _____ NO. TEETH _____ SHAFT DIA. _____
HUB LENGTH _____ ☐ CENTRAL ☐ OFFSET ☐ KEYWAY ☐ BUSHED

NAME _____

COMPANY _____

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GYRO-FLO supplying air to two wagon drills in a quarry.

GYRO-FLO operating backfill tampers on a highway construction job.

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here's why GYRO-FLO *Rotary* Compressors are first choice in Portable Air Power . . .

GYRO-FLO Portables are at the top of the list with hundreds of contractors because there are no valves to leak . . . no pistons, rods or clutch to wear. Discharge temperatures of less than 200°F mean longer hose life. "Air-Glide" capacity control takes the strain off engines by providing stepless regulation of engine speed and compressor output from 0 to 100%. The compressor is really matched to the higher speeds of GM diesels and Continental gasoline engines.

All four GYRO-FLO sizes, 105, 210, 315 and 600 cfm, have been proven on the toughest jobs all over the country. In blistering heat or bitter cold, at sea level or high altitudes GYRO-FLO Rotary Compressors have met every test.

The GYRO-FLO is smaller, simpler, lighter in weight and easier to maintain than any portable compressor ever built before. Your nearest I-R representative will be glad to give you the full story.

Part of the IR CONTRACTORS' COMBINATION . . . **Ingersoll-Rand**

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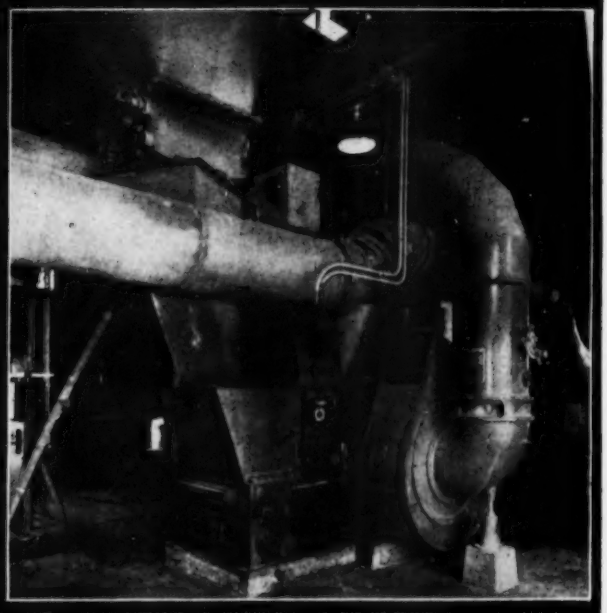
BURN THE *CHEAPEST FUEL* AVAILABLE



Direct-firing with coal. Pulverizer for 2nd kiln in background, left.

FOR THOSE LIME-CEMENT PRODUCERS

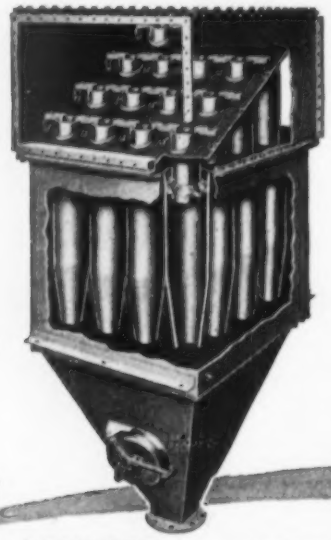
whose plants are *so favorably located,* conversion to natural gas-firing is a "matter of minutes," figuratively speaking. When that fuel becomes available, as pictured above, the first section of burner pipe (elbow) can be removed from fan outlet, and combustion air delivered to the kiln-hood from forced-draft fan . . . out of the picture to the right. GAS SUPPLY HOSE, not visible here, runs behind primary air pipe toward the left. Some of our customers whose gas supply is seasonal . . . or on a "dump" basis . . . have used our pulverizer fan for supplying primary air, after removing fan blades from pulverizer rotor. STRONG-SCOTT PULVERIZERS are readily adaptable to combustion chambers ahead of rotary rock, shale, or coal driers, and waste-heat boilers.

Write now for full information.

THE STRONG-SCOTT MFG. CO.

MAIN OFFICE AND PLANT · TAFT & KENNEDY STS. N. E.
MINNEAPOLIS 13, MINNESOTA

Before you buy *any* equipment for recovering dust . . .



COMPARE ALL OTHERS against MULTICLONE'S Multiple Advantages

Because the advantages of MULTICLONE are so clear-cut, so vitally important, so far-reaching in the savings they make, we urge you to make a factual unbiased comparison of MULTICLONE dust collection equipment against *any other* in the mechanical recovery field. Only by making such a comparison can you fully appreciate the major savings and greater performance you get by installing MULTICLONE Collectors!

COMPARE Recovery Efficiency!

It is a recognized fact that the separating efficiency of a cyclonic tube *increases* as the tube diameter *decreases* because smaller tubes generate greater centrifugal forces. The patented vane in the MULTICLONE makes the use of small tubes *practical* without complicated manifolding and permits compacting many small tubes into one simple, highly efficient unit. MULTICLONE's higher centrifugal forces throw out not only the large, medium and small particles, but also an unusually high percentage of the *extremely small* particles of 10 microns and less. Result—*more complete recovery of all suspended particles from the gas stream!*

COMPARE Space-Saving Compactness!

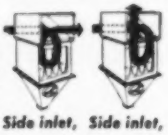
Plant space costs money—particularly at today's high construction costs. Because the MULTICLONE is more compact, size for size, it makes *really important* savings in space and plant costs. Note in the chart how the MULTICLONE requires substantially less space—*both in floor space and cubic space*—than any other unit of comparable capacity and performance. *This means vital savings in construction costs!*

Make	Relative Space Requirements In Sq. Ft.	In Cu. Ft.
Multiclone	1.0	1.0
Collector A	2.1	1.8
Collector B	5.9	3.2
Collector C	6.8	3.9

COMPARE Dollar-Saving Adaptability!

Savings in space is just one of many ways MULTICLONE reduces installation costs. Because the shape of the unit can be readily varied (long and narrow, short and wide, or square) to fit available spaces, the MULTICLONE can often be tucked into odd corners and waste areas too restricted for other equipment.

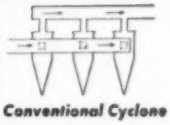
Moreover, inlet-outlet ducts can be varied—side-inlet side-outlet, or side-inlet top-outlet—to meet low headroom or restricted side clearance requirements . . . and the single-inlet single-outlet duct design permits greater flexibility and simpler installation. *These all add up to vital savings in installation costs!*



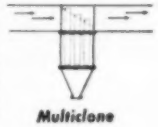
Side inlet, Side outlet ***Side inlet, Top outlet***

COMPARE All-Around Simplicity!

The MULTICLONE is simple and inexpensive to maintain because there are no highspeed moving parts to repair or replace . . . no pads or filters to clean or renew . . . nothing to choke the gas flow or increase draft losses as suspended materials are recovered. In addition, the square, flat-sided shape of the MULTICLONE and its straight inlet and outlet ducts are far simpler to install and insulate. And since the recovered material from an entire bank of tubes is collected in a *single* hopper, it is much easier to service and maintain than the multiple hoppers of conventional cyclone units. *Here again, the MULTICLONE saves in many ways—all of them important!*



Conventional Cyclone



Multiclone

Whether your recovery installation is in a new structure or for modernizing present equipment, you will be far ahead by installing MULTICLONE Collectors. Our experienced engineers will gladly make helpful suggestions for simplifying your recovery problems. A letter, wire or call to our nearest office places this assistance at your service without obligation.

Send for Helpful Literature! This factual MULTICLONE literature explains the basic principles of cyclonic dust recovery and gives technical data helpful to anyone contemplating a dust or fly ash recovery installation. Write today for your free copy!

WESTERN Precipitation CORPORATION

ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1015 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA

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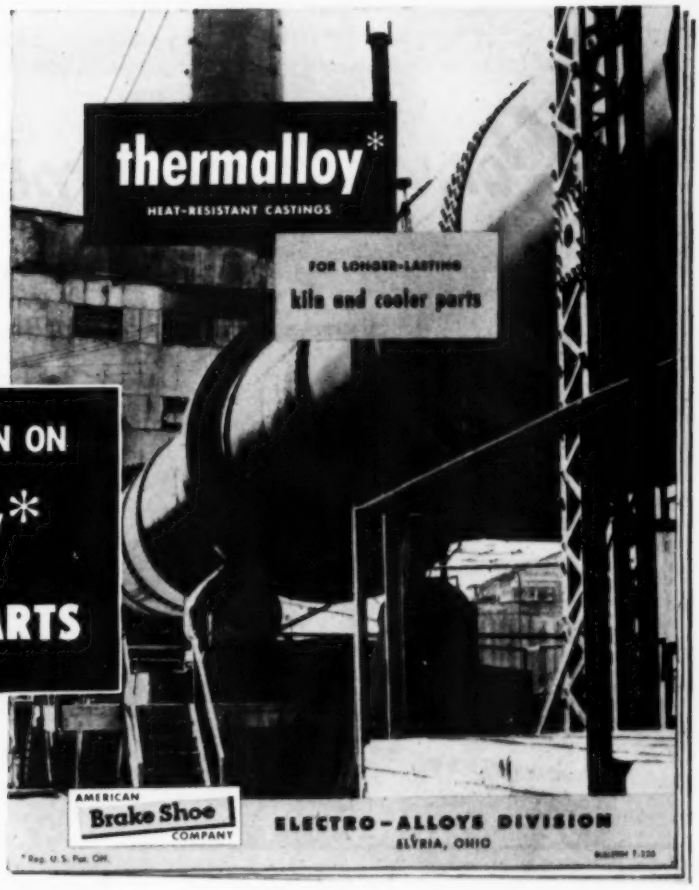
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

SEND FOR THIS NEW BULLETIN ON

thermalloy*

KILN AND COOLER PARTS



See why heat-resistant Thermalloy kiln and cooler parts give longer service life and lower maintenance costs

You get all the facts about Thermalloy kiln and cooler parts in this new and descriptive bulletin.

You will find that Thermalloy is a tough heat-resistant and abrasion resistant alloy developed specifically to take heavy loads and rough usage. You will be able to study detailed diagrams showing how Thermalloy segmental kiln ends are designed to eliminate warping. You will see how Thermalloy feed ends and pipes are easy to install and readily adaptable to your kiln requirements.

Send for your free copy today. Write Electro-Alloys Division, 4004 Taylor Street, Elyria, Ohio and ask for Thermalloy Bulletin T-226.

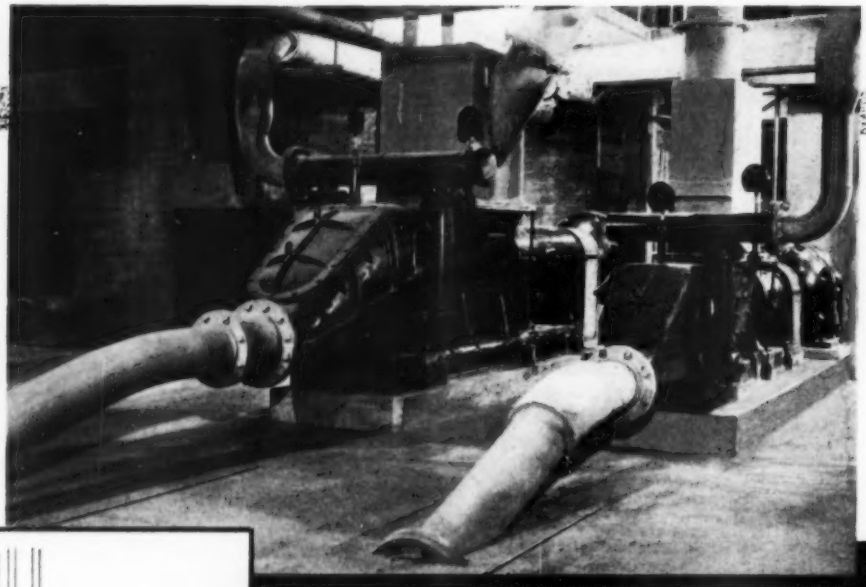
*Reg. U. S. Pat. Off.

AMERICAN Brake Shoe COMPANY

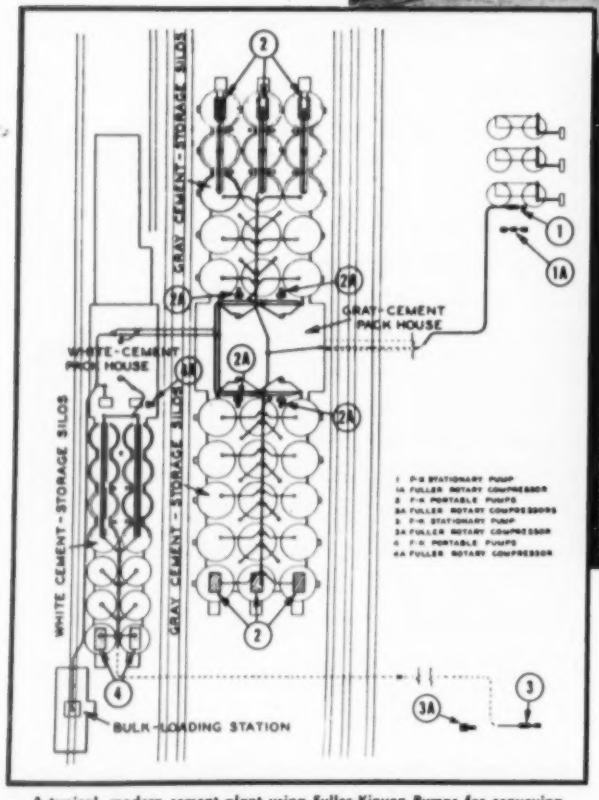
ELECTRO-ALLOYS DIVISION
ELYRIA, OHIO

Conveying Cement in Bulk

for the producer



Two Fuller-Kinyon Pumps in a Southern cement plant. One conveys raw materials to storage; the other finished cement to storage.



A typical, modern cement plant using Fuller-Kinyon Pumps for conveying finished cement to storage, from storage to packer bins, and loading.

During the past 27 years, Fuller Company has worked very closely with the cement industry. Much of its research, manufacturing, and service has been directed toward the industry, not only from the standpoint of better production in the cement plant, but also in the more efficient handling of the finished product by the user in ready-mixed and concrete-block plants, and on large construction jobs.

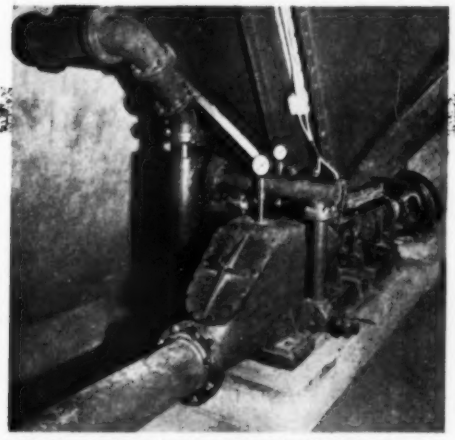
The Company aim—to anticipate the needs of the industry—to design and build better equipment that will perform more efficiently, at the lowest possible operating cost; to better working conditions.

This policy has had its reward . . . the

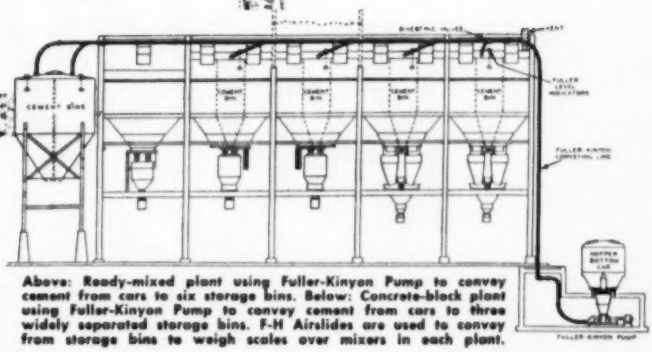
F-H Airslide conveying cement raw materials from bin to elevator, for kiln feed.

·DRY MATERIAL CONVEYING SYSTEMS AND COOLERS . . . COMPRESSORS AND VACUUM PUMPS . . . FEEDERS AND ASSOCIATED EQUIPMENT

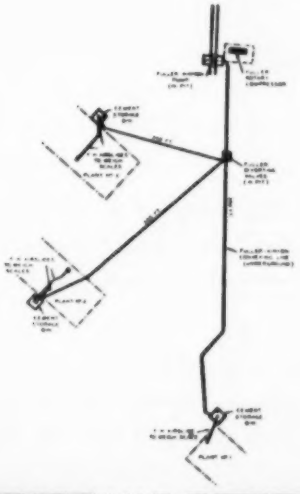
. . . for the processor



Fuller-Kinyon Pump in pit underneath railroad track, conveying cement to storage in a ready-mixed plant.

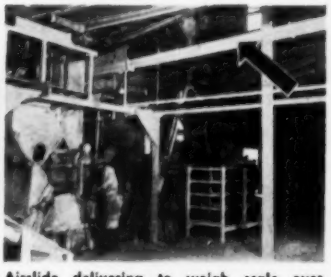


Above: Ready-mixed plant using Fuller-Kinyon Pump to convey cement from cars to six storage bins. Below: Concrete-block plant using Fuller-Kinyon Pump to convey cement from cars to three widely separated storage bins. F-H Airslides are used to convey from storage bins to weigh scales over mixers in each plant.



industry, as a whole, has taken full advantage of it . . . practically every cement plant in the United States, and many in foreign countries, uses Fuller equipment wherever possible. Likewise in the plants manufacturing cement products, you will find Fuller equipment unloading and in-plant handling of cement and other ingredients used in producing the finished product. A large majority of the large dams built during the past few years used Fuller equipment for unloading and conveying Portland cement.

We shall be glad to send you literature covering any of the equipment shown here. Write today.



Two Airslides conveying from storage bins to weigh scales in plants No. 2 and No. 3. Airslide delivering to weigh scale over mixer in plant No. 2.

Fuller-Kinyon Unloader unloading cement from box car.

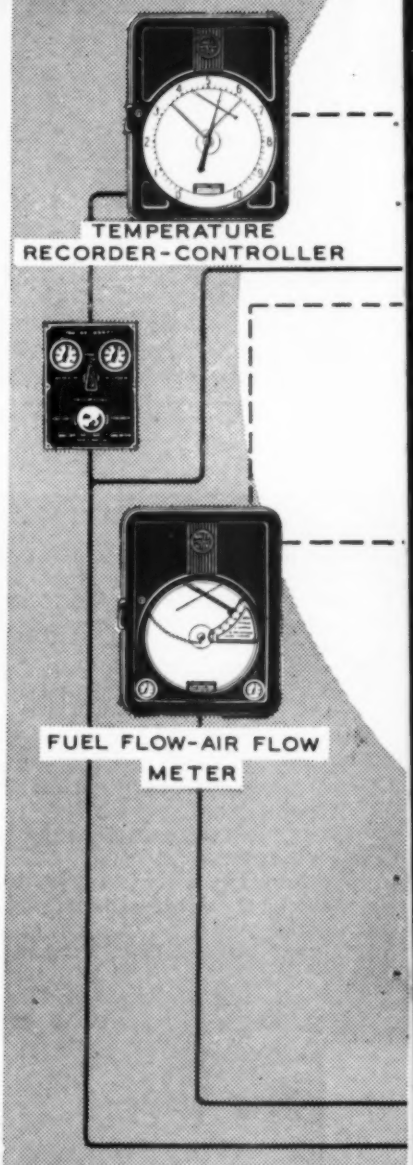
Fuller

FULLER COMPANY Catasauqua, Pa.

G-877-2188

BRANCH OFFICES: CHICAGO • SAN FANCISCO • LOS ANGELES • SEATTLE • BIRMINGHAM

Now! "Self-Serve" operation - Bailey Meter



Your "Self-Serve" Bailey controlled rotary kiln literally thinks for itself and reacts quickly and correctly to any changes in operating conditions. You get:

1. **Economical Operation**—*Gives maximum production from every unit of fuel you burn* because Bailey Combustion Control closely guards Fuel-Air Ratio, Hood Draft, Fuel Feed, Clinker Cooling and Temperature of Air for Combustion.

2. **Uniform High Quality of Product**—Accurate measurement and control of Kiln Speed, Burning Zone Temperature, Combustibles Content and Oxygen Content . . . *for a high grade product, consistently.*

3. **Minimum Maintenance**—Uniform excess air conditions and constant temperatures *prolong the life of your kiln.* Costly refractory repairs and wear and tear on auxiliary equipment are reduced to a minimum.

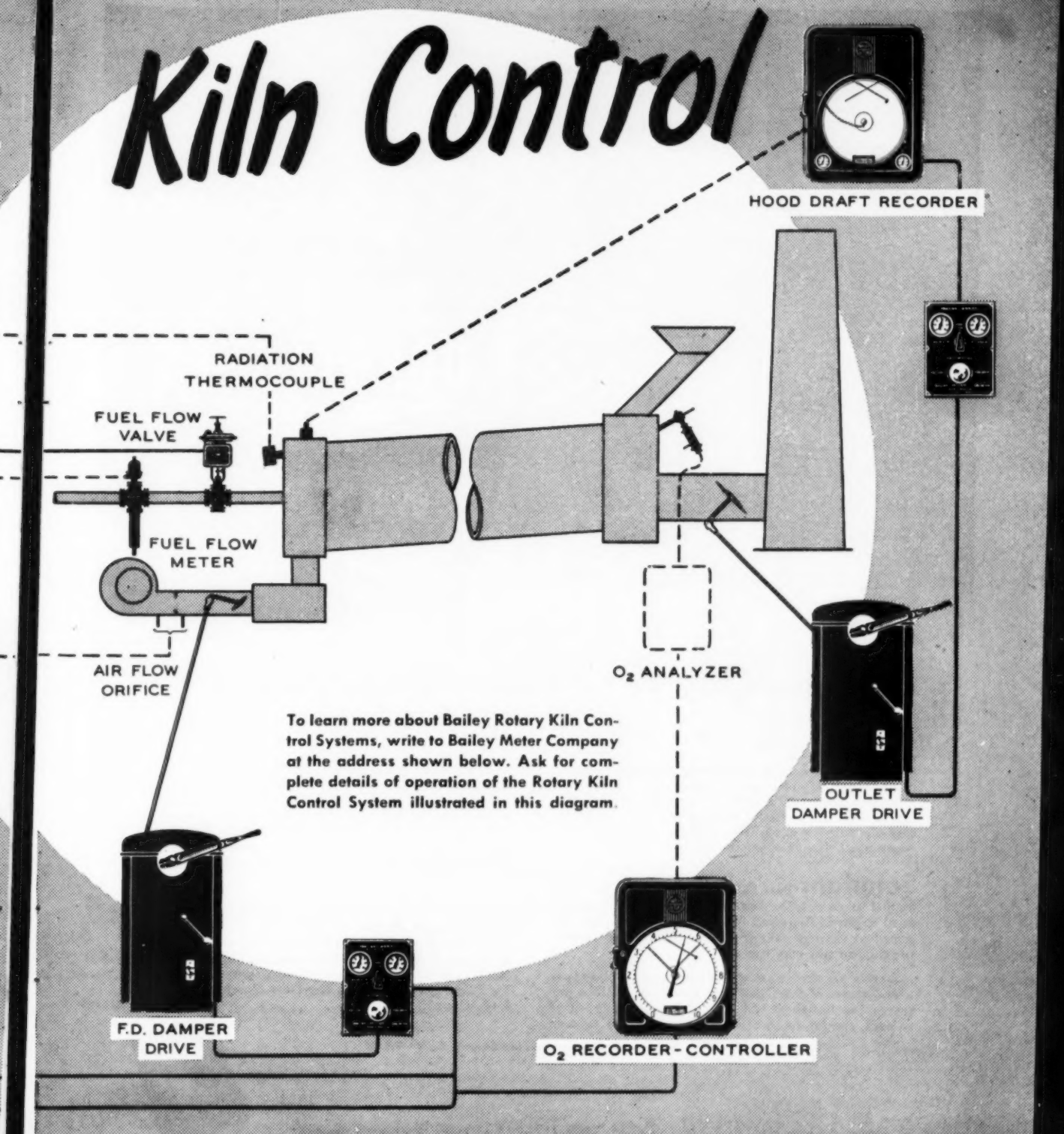
The accompanying diagram shows one way in which Bailey instruments and controls can give you a "Self-Serve" Kiln. Other arrangements to suit the requirements of any rotary kiln are available.

Bailey Meter Company maintains a staff of engineers who are experts in the control of rotary kilns. Let one of these men help plan a control system to give you a "Self-Serve" rotary kiln.

P-23

Bailey Meter Company

Kiln Control

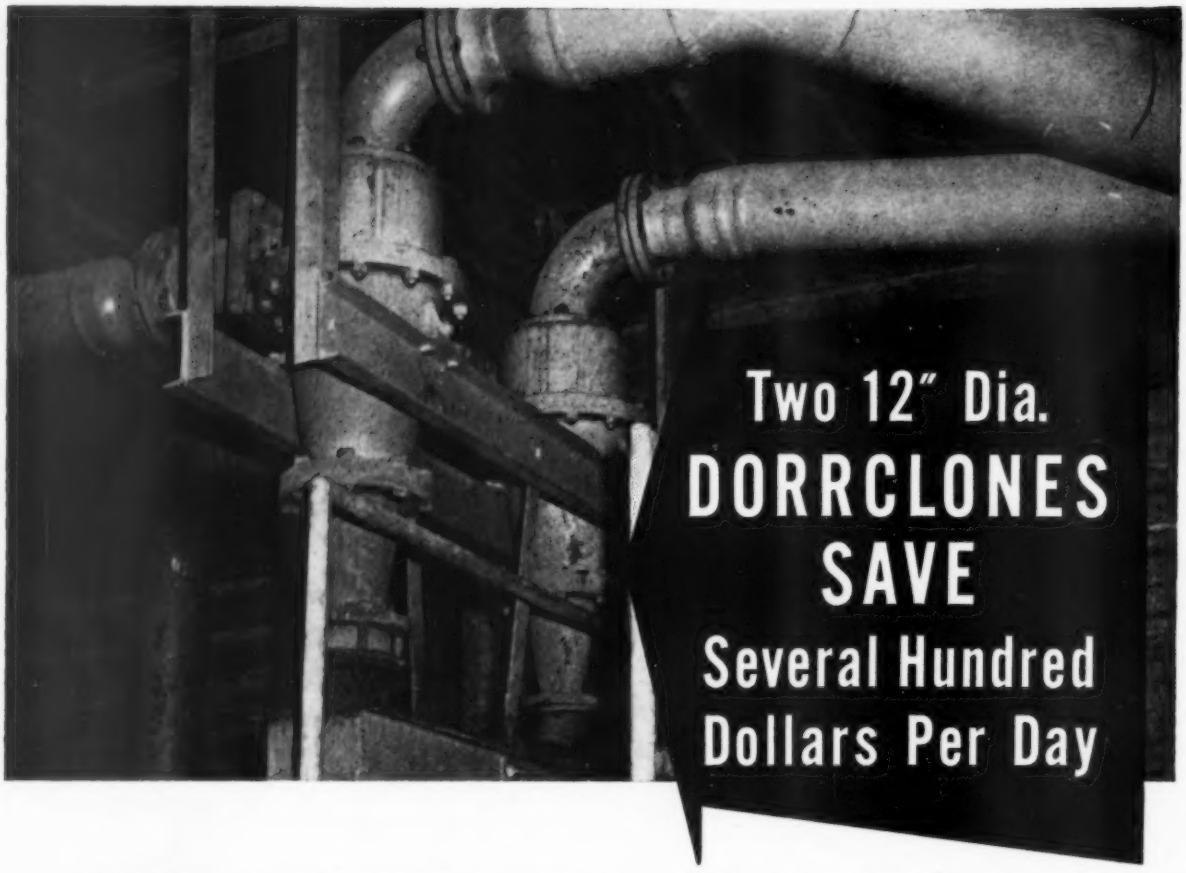


To learn more about Bailey Rotary Kiln Control Systems, write to Bailey Meter Company at the address shown below. Ask for complete details of operation of the Rotary Kiln Control System illustrated in this diagram.

Meters and Control Systems for Process Plants

1051 IVANHOE ROAD • CLEVELAND 10, OHIO

Bailey Meter Company Limited • Montreal



On Raw Clay For Cement Manufacturer . . .

Problem: A Southeastern cement manufacturer needed clay of a certain composition for his mix. A local deposit was available but silica content ran too high for direct use. Alternatives were — bring in clay of a suitable grade from a distance . . . or find an economical way to up-grade the local material.

Solution: Two 12" dia. DorrClones were installed to classify the raw clay slip prepared from the local deposit. Required grades for the mix are produced at savings averaging several hundred dollars per day on raw clay costs.

Here's another case where the unique classification features of the DorrClone have paid off in a wet processing flowsheet. At this plant, three types of cement are produced . . . each requiring a specific grade of clay in the raw mix. Two 12" dia. DorrClones degrit high silicon content clay from a local deposit to supply all three grades. Equally important, silica is reduced to the desired amount in each grade simply by varying the feed pressure to the units. No additional dilution is necessary and the excess silica is removed as a low moisture underflow product.

If you have a desliming or degritting problem, there's a good chance that the DorrClone, with its high-capacity-for-size and ability to handle flocculent or heavy pulps, will be the solution. If you'd like further information on this flexible new unit, write for Bulletin No. 2500 to The Dorr Company, Stamford, Conn.

DorrClone is a trademark of The Dorr Company, Reg. U.S. Pat. Off.

Better tools TODAY to meet tomorrow's demand

DORRCO

DORR

WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

THE DORR COMPANY • ENGINEERS • STAMFORD, CONN.

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Like all PIONEER jaw crushers, the 42" x 48" has an all-welded steel base of double-wall, box-type construction. Design reduces weight, but strength is substantially greater than is possible with a cast steel base of the same dimensions.

Hydraulic process uses oil pressure to expand inner races of shaft bearings. This permits bearings to slide freely from shaft so that bearing check-up and maintenance become relatively simple. Shaft is 10' long, 14½" in diameter between bearings. Shaft stroke is 1¼".

Giant New Jaw Crusher Rated to Deliver Over 600 TPH at 13" Setting

Workmen are dwarfed by the 19,000 lb. pitman and 5200 lb. shaft assembly being lowered into place as PIONEER assembles the world's largest overhead eccentric jaw crusher. This 42" x 48" crusher reduces rocks in a 4 cu. yd. crushing chamber at a calculated capacity of over 600 tph with maximum jaw setting of 13". Minimum setting is 4". Length of moving jaw is 104"; stationary jaw, 90". Crusher was designed to reduce drilling and blasting costs.

Welded steel construction of the base allows crusher to be built with a total weight of less than 95,000 lbs. These features are important in preventing excessive maintenance cost: A patented closure between inner and outer bearings which makes it possible to place bearings closer together than on any other anti-friction bearing jaw crusher . . . thus greatly reducing shaft strain. Outer bearings saddle-mounted in the frame on precision-machined parts. Split-reversible jaw plates, cast from tough, alloyed manganese steel, designed to prevent cold flow and peening. Toggle plate safety device protects crusher when non-crushable material enters chamber.

Want the production reports on how this giant crusher can cut operating costs for cement and lime producers? Write now to

Pioneer ENGINEERING WORKS, INC.
Minneapolis 13, Minnesota
(SUBSIDIARY OF POOR & COMPANY, CHICAGO)

Ready to go. Giant crusher is ready for shipment to the U. S. Lime Products Corp., Las Vegas, Nevada. Two-unit base permits easy handling by standard equipment.

If ABRASION is Your Problem...

specify NI-HARD for Your Answer

One of the most abrasion resistant products of the iron foundry is a nickel-chromium white iron trade-named "NI-HARD.*"

STRUCTURE

Unlike other cast irons . . . the structure of NI-HARD is as hard as that of fully hardened steel.

It contains a multitude of firmly embedded hard carbides which account in part for its unusual resistance to abrasive wear. The Brinell hardness of this nickel-chromium white iron ranges from 550 to 650 when sand cast, and from 600 to 725 when chill cast. NI-HARD for all practicable purposes is unmachinable and finishing requirements are met by grinding or by the use of cast-in-place machinable inserts.

As a result of its unusual structure, NI-HARD provides abrasion resistance at lowest ultimate cost.

PERFORMANCE

NI-HARD develops abrasion resistance two to three times better than that of unalloyed white iron. Therefore NI-HARD can economically replace white iron.

NI-HARD lasts one and one-half to two times as long as austenitic manganese or carbon steels, under conditions involving only moderate impact. Chill cast parts are stronger and more abrasion-resistant than comparable sand castings.

APPLICATIONS

Applications include: grinding balls, ball and rod mill liners, slurry pump parts, flotation impellers, piping, scoop lips, classifier shoes, roll heads, pulverizer rings, chutes and hopper liners, muller tires, plows, pug mill knives, clay augers. Also coke grizzly discs, crusher rolls, coal mine pumps, dredge pump impellers, liners, rings and sleeves. Also industrial food grinding burrs and attrition mill plates.

AVAILABILITY

Try NI-HARD wherever you encounter severe abrasion. See for yourself how its remarkable properties minimize replacements and repairs.

Authorized foundries throughout the country readily produce NI-HARD castings in all forms and shapes common to the iron and steel foundry.

At the present time, nickel is available for end uses in defense and defense supporting industries. The remainder of the supply is available for some civilian applications and governmental stockpiling.

INFORMATION AVAILABLE

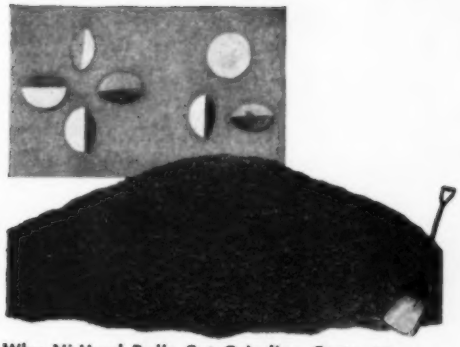
Full information is yours for the asking. Write for the booklets, "Engineering Properties and Applications of NI-HARD," and, "Buyers Guide for NI-HARD Castings."

*Reg. U. S. Pat. Off.

EMBLEM OF INCO SERVICE

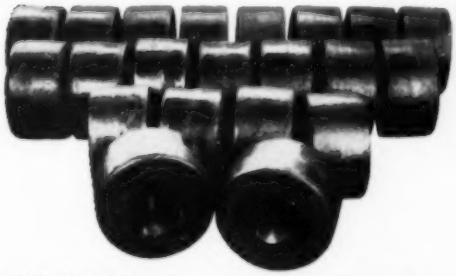
THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

Reduce Abrasive Wear
Minimize Repairs
obtain Steady Output
by Using NI-HARD



Why Ni-Hard Balls Cut Grinding Costs. The sections, illustrated at left above, show soundness of Ni-Hard. Unlike other cast irons, NI-HARD comprises multitudes of hard carbides firmly embedded in a matrix as hard as fully hardened steel. Balls are cast in sizes from ⅝" to 1¼".

Chilled Ni-Hard Liners are being used by cement companies throughout the world. Scores of operators report that NI-HARD doubles the useful life of liners. In both wet and dry mills, this extended liner life results in substantial savings.



Ni-Hard Roll Heads can be produced with a definite chilled depth that raises the efficiency of the mill throughout the long life of the head. NI-HARD has extended the life of roll heads used for pulverizing phosphate rock, limestone, clinkers, etc., 2 to 5 times.

Ni-Hard®...an abrasion-resisting nickel white iron...has proved the answer to hundreds of problems involving severe abrasive wear. During the past 20 years it has set notable records for length of service, down-time savings and *ultimate economy* where wear-resistance is the primary requirement.

Actual tests in grinding cement clinker proved Ni-Hard balls lasted 4 to 5 times longer than hardened forged steel balls. In tests now in progress in grinding wet cement stone Ni-Hard balls show a superiority ratio of approximately 1½ to 1.

Ni-Hard liners double and triple time intervals between relinings, and Ni-Hard roll heads show even better ratios of superiority. See the typical illustrations.

At the present time, nickel is available for end uses in defense and defense-supporting industries. The remainder of the supply is available for some civilian applications and governmental stockpiling.

SOURCES OF SUPPLY FOR NI-HARD CASTINGS

EASTERN SECTION

Abrasive Alloy Castings Co.
Bridgeboro, N. J.

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Irvington 11, N. J.

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Rochester 11, N. Y.

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Staver Foundry Co.
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Pekor Iron Works, Inc.
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Columbus, Ga.

Texaloy Foundry Co.
P.O. Box 7134
San Antonio 10, Tex.

Thomas Foundries, Inc.
3800 10th Ave. No.
Birmingham 1, Ala.

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Helena, Mont.

Capitol Foundry Co.
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Darbyshire Steel Co., Inc.
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Eagle Foundry Co.
75 Horton St.
Seattle 4, Wash.

Pacific Ball Mfg. Co.
P.O. Box 106
Southgate, Calif.

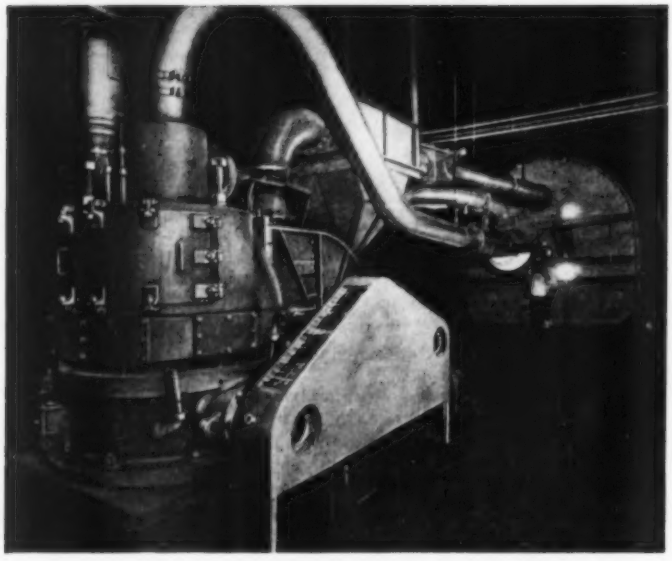
Pacific Foundry Co., Ltd.
3100 19th St.
San Francisco, Calif.

Stanley Foundries
6009 Sante Fe Ave.
Huntington Park, Calif.

Union Iron Works
P.O. Box 2135
Spokane 2, Wash.

Write to your nearest supplier or International Nickel for your copy of "Engineering Properties and Applications of Ni-Hard."

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

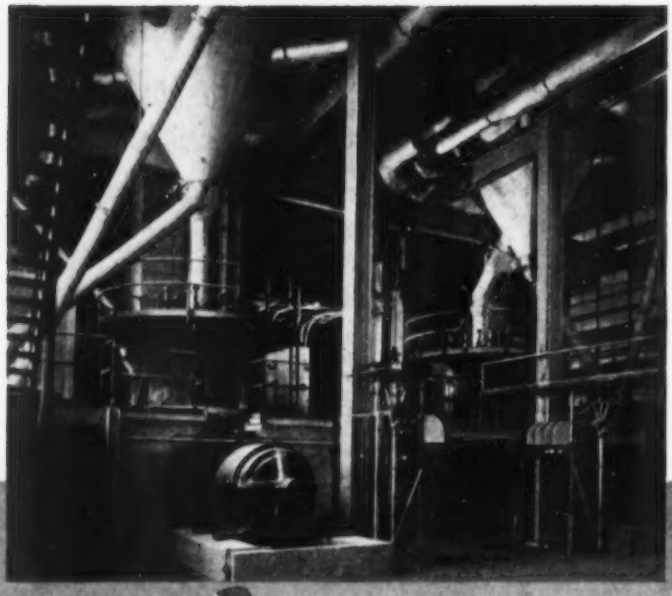


1

B&W DIRECT-FIRING FOR KILNS

The ultimate in kiln firing is obtained with the B&W Direct-Firing System, using the B&W Type E Pulverizer.

This system provides: (1) High availability; (2) Low operating costs; (3) Uniform delivery of coal; (4) Low rate of wear on grinding elements — hence low maintenance; (5) Ability to handle high-moisture coals.



2

B&W CLOSED-CIRCUIT RAW GRINDING SYSTEM

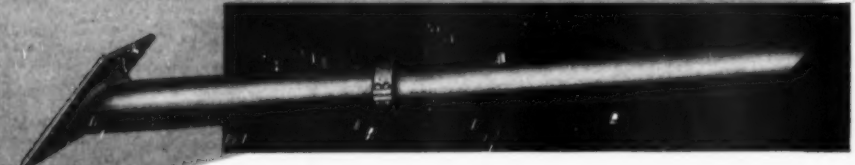
High grinding efficiency, high fineness and low power consumption characterize the B&W Pulverizer for raw material grinding. It is widely and successfully used for pulverizing cement rock, limestone, shale, phosphate rock, ores, and other materials. Drying can be accomplished within the system.

Power requirements are low and efficiency is high. Low maintenance and minimum floor space are also features.

3

B&W NOSE-RING CASTINGS

These castings are demonstrating outstanding ability to outlast conventional design by wide margins, reduce kiln maintenance, and prevent costly shutdowns; belling out of kiln shell is eliminated, resulting in maximum nose brick life; protecting flange on casting permits use of low-alloy steel bolts.



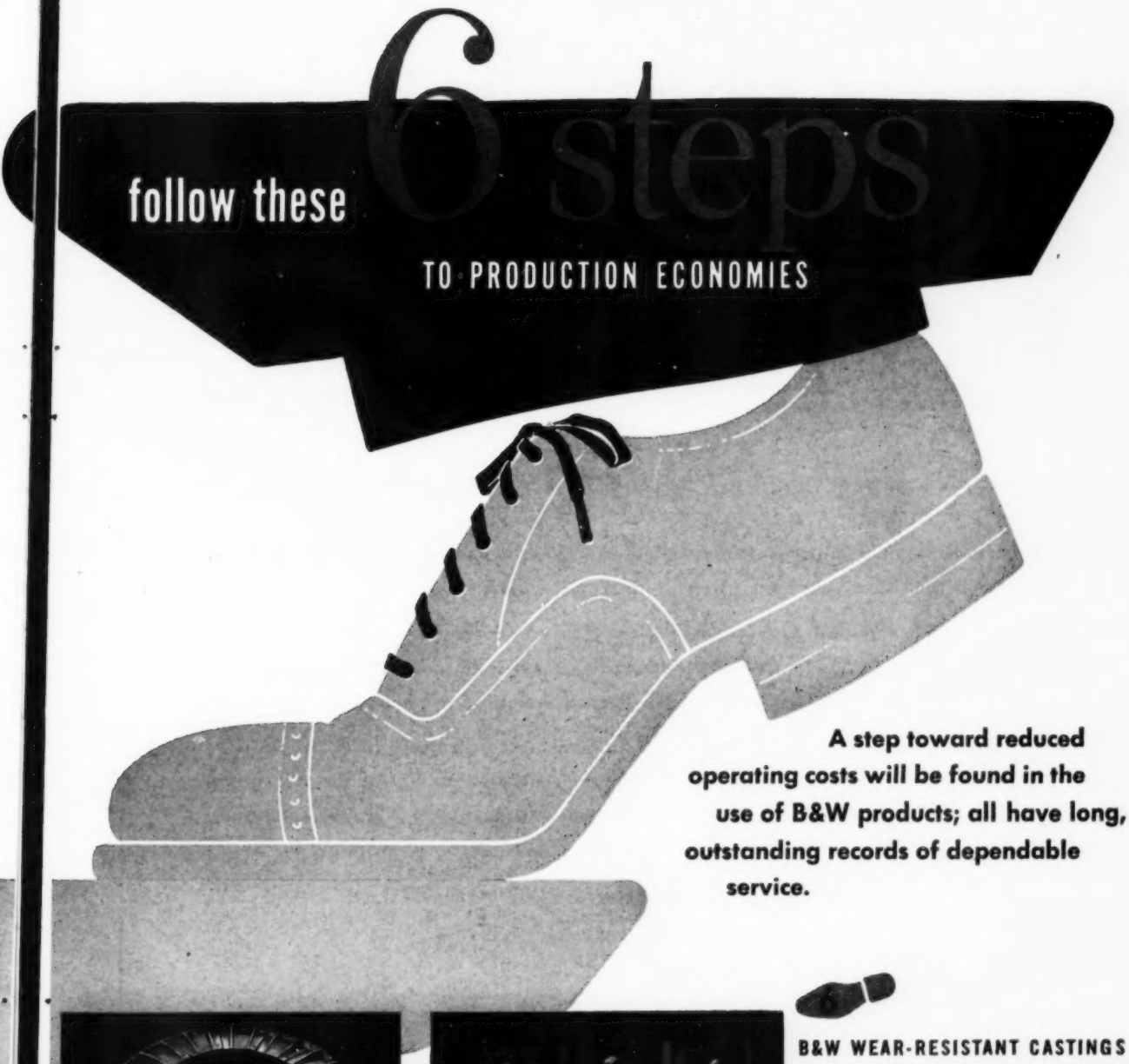
4

B&W KILN FEED PIPES

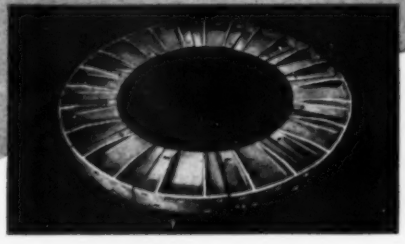
These feed pipes are widely used in cement plants because of their resistance to both heat and destructive abrasion. A central C clamp permits renewal of the lower portion if necessary.

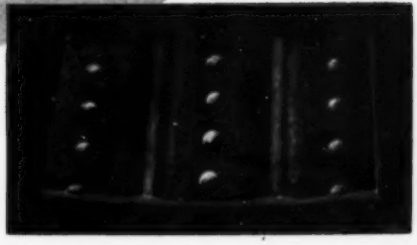
C-2007

follow these 6 steps TO PRODUCTION ECONOMIES



A step toward reduced operating costs will be found in the use of B&W products; all have long, outstanding records of dependable service.





B&W WEAR-RESISTANT CASTINGS

Chilled iron and alloy steel liners, roll heads, slugger plates and other B&W wear-metal castings are CAST TO LAST . . . keep grinding and crushing equipment on the job . . . prevent unscheduled shutdowns for costly, time-consuming repairs and replacements.

B&W RETAINING RING CASTINGS

These tail ring castings give long and economical service at feed-ends of rotary kilns in temperatures exceeding 1200 F. They provide proper size kiln openings without special installations and cutting of bricks. Overlapping segments eliminate spillage of raw materials in dust chamber, and reduce stack losses. Provision for ample expansion eliminates bell-mouthing and consequent effect of kiln sealing.

BABCOCK & WILCOX

GALION LEADS AGAIN!

All Galion Allsteel Dump Bodies are now made of

HIGH TENSILE STEEL!

lighter in weight • stronger

● Effective immediately, the complete Galion Allsteel dump body line of 3 to 27 ton units, will be constructed exclusively of high tensile steel.

Use of this material, previously employed only in special extra-cost, heavy duty bodies will make possible over-all weight savings up to 25%. It will greatly increase payload capacities by cutting down body dead weight to the absolute minimum.

High tensile steel bodies are also far stronger than previously-available standard dump bodies. **High tensile steel has a minimum yield point of 50,000 lbs. per square inch as compared to 25-30,000 lbs. for hot-rolled carbon steel. Consequently body strength is greatly enhanced without adding a single pound of weight.**

OTHER HIGH TENSILE ADVANTAGES

- ✓ **4 to 6 times greater corrosion resistance.**
- ✓ **better paint adherence.**
- ✓ **improved resistance to abrasion.**

Ask your Galion distributor for additional high tensile body facts—today! He'll be glad to tell you about the Galion Allsteel line—"first" in dump bodies and hydraulic hoists for over 40 years.

A-7728

OTHER GALION PRODUCTS:

Mighty-Mite twin cylinder hoist

Standard hydraulic hoists and bodies

Heavy duty hydraulic hoists and bodies

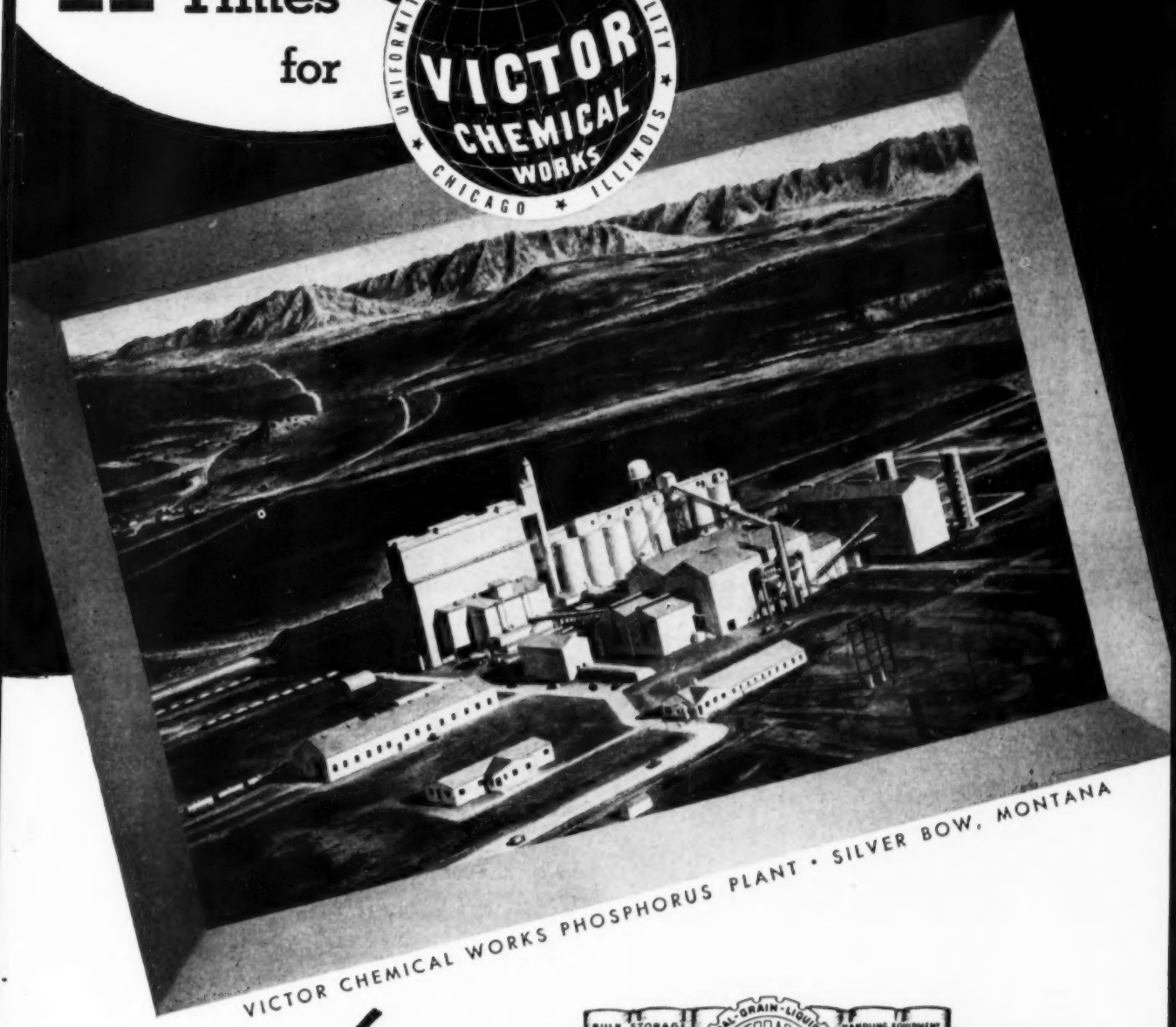
Telescopic hoists and trailer bodies

Load-ovator hydraulic end-loader

THE GALION ALLSTEEL BODY COMPANY • GALION, OHIO

11 Times for

VICTOR CHEMICAL WORKS
UNIFORMITY ★ PURITY ★ STABILITY
CHICAGO ★ ILLINOIS



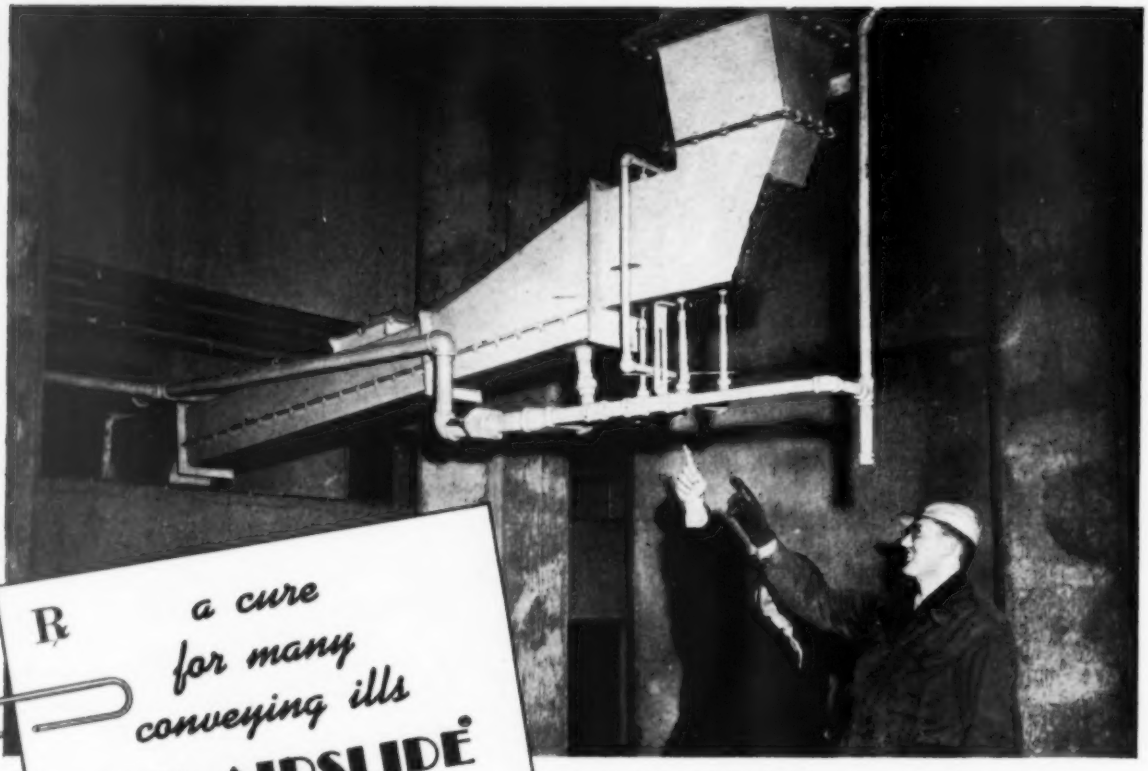
VICTOR CHEMICAL WORKS PHOSPHORUS PLANT • SILVER BOW, MONTANA

by

THE NICHOLSON CO.
BULK STORAGE · COAL · GRAIN · LIQUIDS · STORAGE · HANDLING EQUIPMENT · CONSTRUCTION · CEMENT · OIL · CHEMICALS

11 TIMES — Victor Chemical Works has chosen *The Nicholson Co.* to build its ever expanding facilities. In your expansion or new construction take advantage of the NICHOLSON complete plant construction service as well as its 40 years of specialized design and building experience in the field of bulk materials storage and handling facilities.

10 ROCKEFELLER PLAZA • NEW YORK 20, N. Y.



a cure for many conveying ills

F-H AIRSLIDE

F-H Airslide and F-H Airfeeder transporting Portland cement from a silo to a screw conveyor. Rapid, clean, safe, economical, and efficient transfer of material.

Maybe your production is suffering because of stoppage and breakdown ills in your conveying systems. These can be very serious and costly . . . timeouts can never be recovered. When you have a "sick" conveying system, why not consult a specialist, one which has pioneered in the field of conveying by air for 26 years.

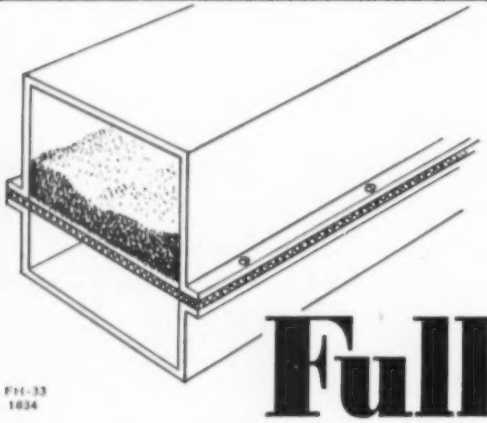
Fuller designs and builds four basic systems for conveying dry, fine materials, from which it can select and recommend the one, or a combination, to meet your own particular requirements, efficiently and economically. We have done it for thousands of others and can do it for you.

Illustrated is one of the four "conveying by air" systems we build, the F-H Airslide, which operates on the principle of fluidizing dry, fine materials with a small volume of low-pressure air, causing the material to flow like a liquid on a slightly inclined plane. Economical of operation, because, it has no moving parts, requires no lubrication, and power required is exceedingly low.

Fuller will be glad to make a study of your conveying ills and make recommendations, together with proposal drawings and estimates . . . with no obligation for this service.

Write today for Bulletin FH-2, illustrating and describing the F-H Airslide Conveyor.

Fuller Company is the exclusive manufacturer of air gravity conveyors, except for use in motor vehicles, under Huron Portland Cement Company U. S. Patent Nos. 2,316,814, 2,517,837, 2,527,394, 2,527,455, 2,527,466 2,527,488, 2,589,968 and Patents Pending.



FULLER COMPANY, Catasauqua, Pa.
120 So. LaSalle St. Chicago 3
420 Chancery Bldg., San Francisco 4

Fuller

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—
COMPRESSORS AND VACUUM PUMPS—
FEEDERS AND ASSOCIATED EQUIPMENT

FH-33
1034

NEW *AGITAIR Direct-Fired Hot Gas Generating FURNACES*

Capacities from 600,000 to 100,000,000 BTU's

AGITAIR Direct-Fired Furnaces are highly efficient heat producing units successfully used with RAW ROCK and CLAY GRINDING SYSTEMS for drying raw rock for cement mills, pulverized limestone, kaolin, and many other products requiring heating or process drying.

These furnaces are built of heavy steel fabrication with combustion chambers designed for high BTU releases. Constructed with high grade heat resisting materials. Design and construction incorporates latest development in the field of combustion.

COMPACT—little floor space or head room required.

OIL or GAS FIRED with combination for oil or gas firing.

MINIMUM COMBUSTION SPACE—reduces refractory lining—less maintenance cost.

PACKAGE UNIT with panel for automatic controls furnished fully wired. Light-weight insulating type refractories, when required, are factory installed.

INSTALLATION requires only a minimum of field labor—connections of fuel lines and electric circuit wires only requirement.

INSTALLATION COST—AGITAIR Direct-Fired Furnaces are easy to erect—the cost is a very small fraction of that for indirect fired furnaces—no expensive chimneys.

EFFICIENCY 90 to 95%—There are no stack losses from AGITAIR Direct-Fired Furnaces. Virtually all of the heat generated is utilized—air cooled combustion chamber shell reduces radiation losses to a minimum. High efficiency means less fuel required for a given heat output. Low BTU cost.

SPACE REQUIREMENTS—Available in vertical units where floor space is limited... horizontal where head room is a problem.

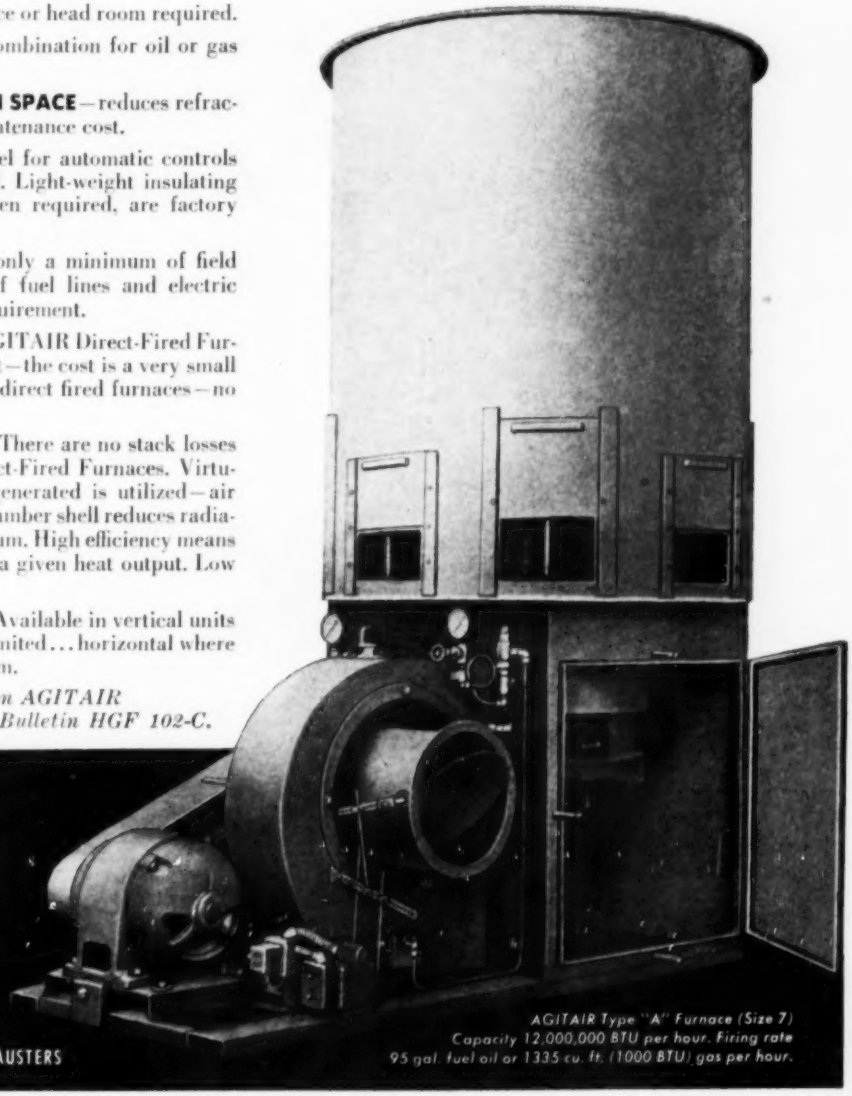
For further information on AGITAIR Furnaces write for Bulletin HGF 102-C.

AGITAIR Furnaces are made in two distinct types, "A" and "AP," in vertical or horizontal units, in a variety of sizes.

Type "A" illustrated below is designed for "*pull-through*" induced draft systems with furnace operating under *negative pressure.*

Type "AP" is for "*push-through*" forced draft systems with furnace operating under *positive pressure.*

These direct-fired furnaces attain BTU releases as high as 500,000 per cu. ft. of furnace volume.



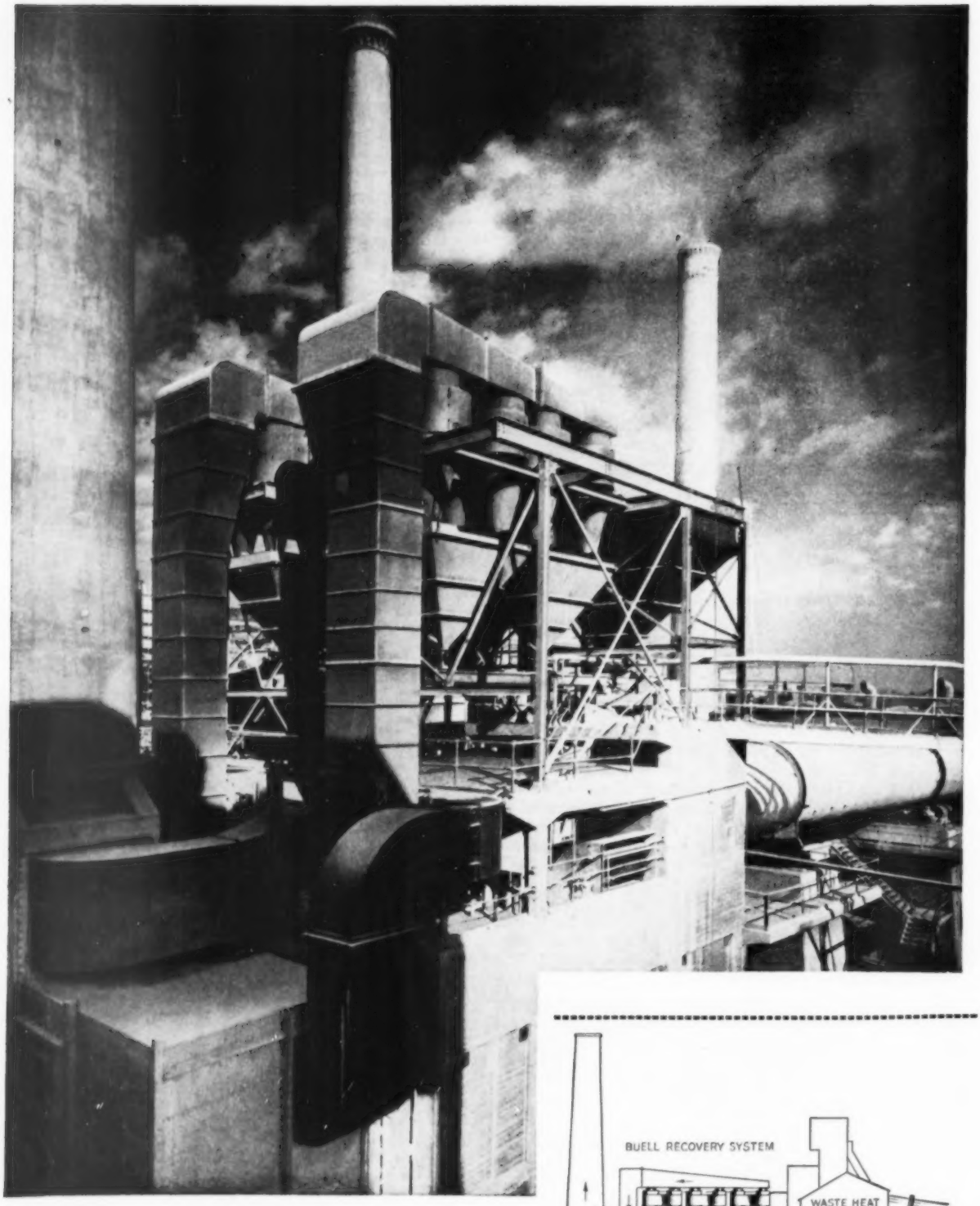
AGITAIR Type "A" Furnace (Size 7)
Capacity 12,000,000 BTU per hour. Firing rate 95 gal. fuel oil or 1335 cu. ft. (1000 BTU) gas per hour.

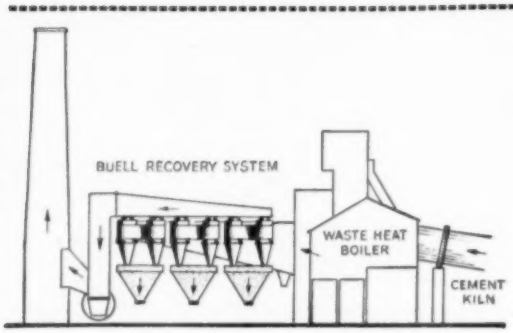
AIR DEVICES Inc.

17 East 42nd Street
New York 17, N. Y.

AIR DIFFUSERS · FILTERS · EXHAUSTERS

In Cement and Lime Kiln





Dust Recovery...

BUELL TOPS THEM ALL

Buell Recovers More Dust

High Cyclone efficiency... with the exclusive van Tongeren 'Shave-Off'... fits hand in glove with industry needs. Loss in the gas outlet consists mainly of alkalis, permitting the cement dust to be returned to kilns without any interruption to manufacturing operations.

Buell Cyclones Don't Plug

Large diameter cyclones and outlets just won't plug. All cyclones operate at same high efficiency . . . even gas distribution prevents overloading some cyclones while others loaf.

Wear Resistant, No Maintenance

Heavy steel plate construction and large diameter cyclones cut the abrasive effect of rock dust to a minimum. Cost of shutdowns, clogging and repairs at a practical zero.

BUELL 'SF' ELECTRIC PRECIPITATOR

for the collection and recovery of fine dusts, fumes and vapors features design advancements resulting in superior performance. Thoroughly proven by many installations it is available in sizes and types to meet specific requirements.

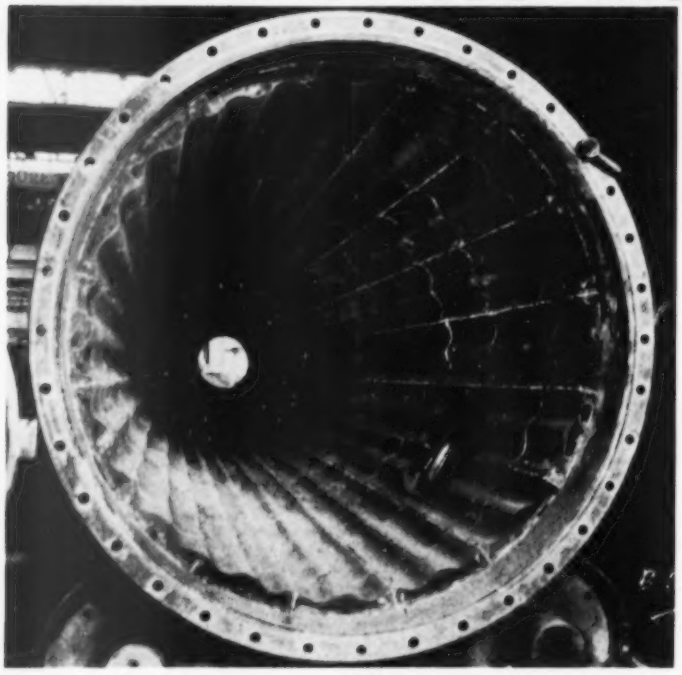
We will be glad to consult with you on your dust recovery problem. Buell Engineering Company, 70 Pine Street, Dept. 18-G, New York 5, N. Y.

buell

Engineered Efficiency in DUST RECOVERY

"The CASTING that's LASTING"

Cuts CEMENT Costs



It's Another
"TREADWELL"
Installation

"TREADWELL" cast these Ni-Hard liners in a 7' x 26' Tube Mill used for wet grinding cement stone.

We supply these Hi-Hard abrasion-resistant castings for crusher parts, etc., and also provide ductile iron, heavy gray iron, and electric furnace steel castings.

Complete facilities for gamma raying, magnafluxing and mechanical testing. Complete machining facilities.

TREADWELL ENGINEERING Co., Easton, Pa.

Pit and Quarry Helps You Operate More Profitably

Every issue of PIT AND QUARRY is full of information you can use in your business. It gives you practical ideas on every phase of your operations.

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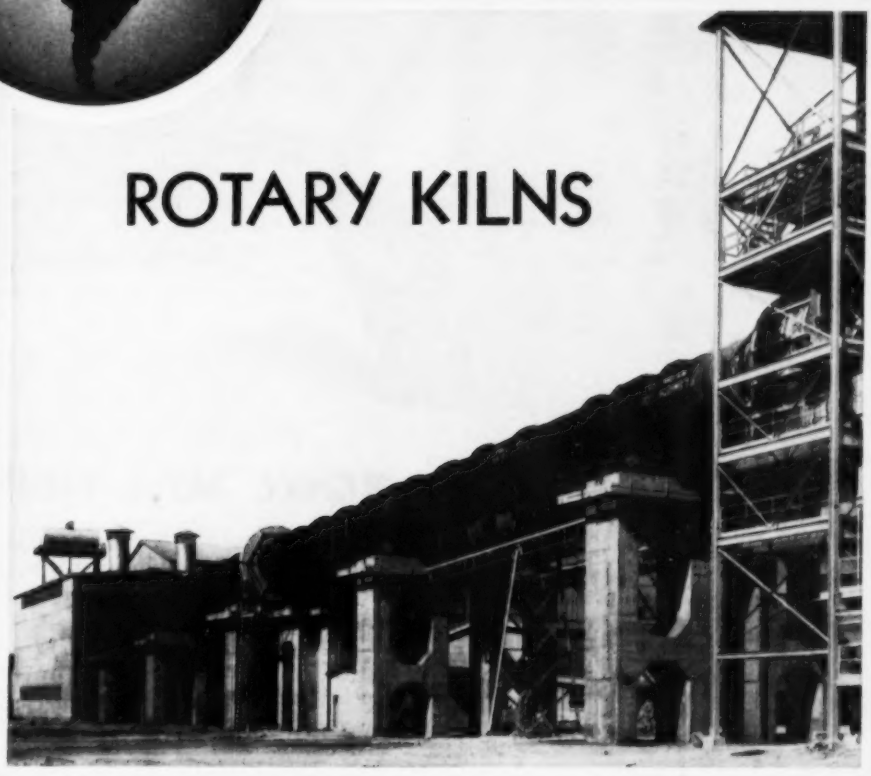
for effective disposal of your used equipment

SMIDTH

ROTARY KILNS



Smidth machinery has been supplied to over 70 countries of the world including 1000 rotary kilns and 5000 grinding mills, plus auxiliary machines such as coolers, agitators, washmills, pumps, conveyors, packers, separators, etc. for use in Cement, Lime and Ore plants.

For Smidth Machinery apply to:

F. L. Smidth & Co., A/S
Vestergade 33,
Copenhagen K, Denmark

F. L. Smidth & Co.
11 West 42nd Street
New York 36, N. Y.

F. L. Smidth & Co., Ltd.,
105, Piccadilly,
London, W. 1, England

F. L. Smidth & Cie France
80 Rue Taitbout
Paris (9e) France

F. L. Smidth & Co. of Canada, Ltd.
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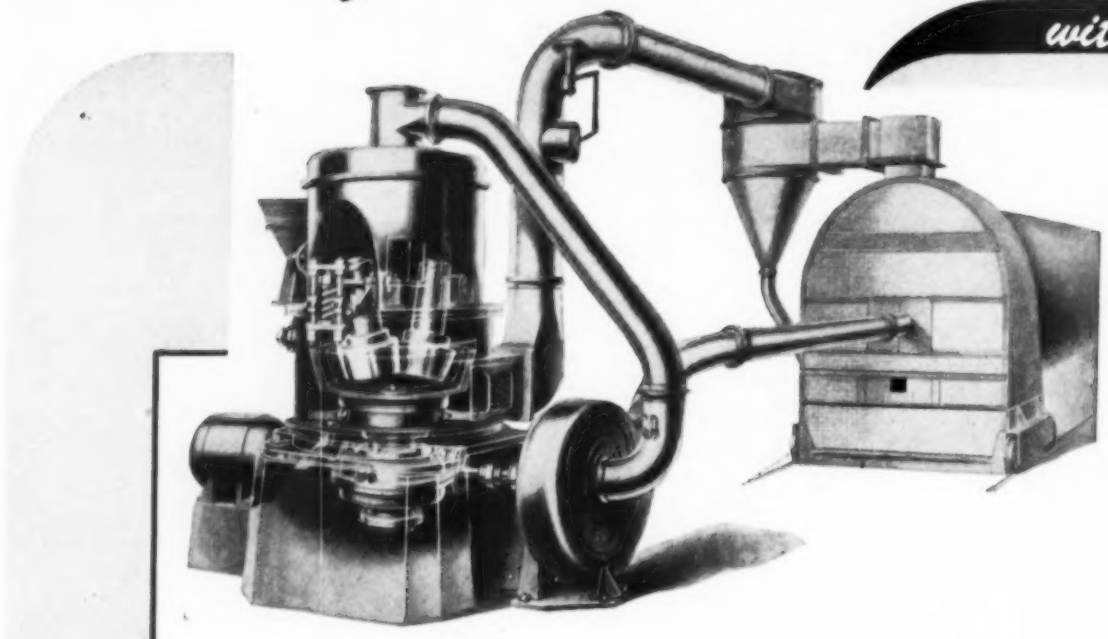
F. L. Smidth & Co. (Bombay) Ltd.
42 Queen's Road
Bombay, India

Modernize YOUR KILN FIRING AND

with



BOWL MILL FIRING

OVER 270 Units installed since 1935 with a total rated capacity of more than *twelve million* tons of coal pulverized per year in the Cement, Lime and burned Dolomite fields alone.

This is the success story of the Raymond Bowl Mill which today has become industry's main reliance for obtaining high efficiency in direct-firing rotary kilns.

The Bowl Mill handles coal of any grade, grindability or moisture content . . . and is capable of continuous 24-hour operation for extended periods without shutdowns.

You can depend upon the Bowl Mill to give you consistent economies in operation, maintenance and supervision. It provides an important factor in lowering cement production costs.

For further details, write for Raymond Catalog No. 62

VISUAL CONTROL STATION

provides a continuous picture of Bowl Mill operation with centralized controls for Temperature, Feed Rates, Exhauster Pressure, Mill Air Flow and Amperage.

COMBUSTION

Raymond

SINCE 1887 — PULVERIZER DIVISION

CEMENT CLASSIFYING OPERATIONS

RAYMOND EQUIPMENT

WHIZZER SEPARATION

The **double whizzer** type of Raymond Mechanical Air Separator is an important unit for improving cement production because of its special features:

The whizzer principle of classification maintains consistent uniformity of the finished material so it is easier to meet top specifications.

It provides close control over specific surface areas and one of the most valuable features of all is the fineness adjustment feature. This enables you to cover the fineness range from standard cement to high early strength cement by external adjustment while the separator is running. There is no need of shutting down to make internal changes.

The overall economy of the Raymond Separator is a factor in keeping down the per-barrel cost of cement. Its minimum power requirements, its unusually low maintenance and operating costs, are advantages made possible by extra sturdy construction. It greatly increases mill output when used in closed circuit operations, thus further reducing unit costs.

Raymond Whizzer Separators are equally efficient in handling other non-metallic minerals and manufactured products, either in producing fines, or in dedusting materials to give a product of specified particle size.

FULL RANGE OF SIZES

Built for various capacities in diameters from 4' to 18' standard commercial sizes; also 30-Inch Separator shown at left.

Raymond Laboratory Air Separator is a complete motored unit for classifying test samples.

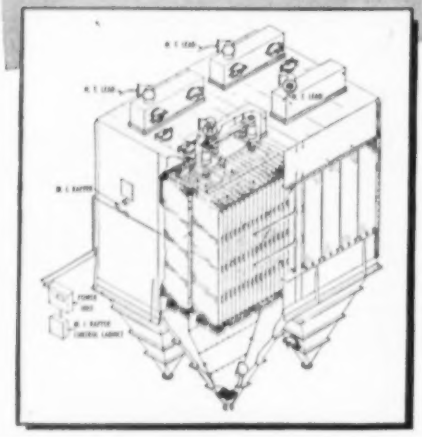
Write for information about the new Raymond SUPER SEPARATOR for extreme high fineness classification.

ENGINEERING, INC.

1321 NORTH BRANCH STREET • CHICAGO 22, ILLINOIS

Sales Offices in Principal Cities

NEW!
COTTRELL M-I RAPPER
ELIMINATES ALL FOUR...



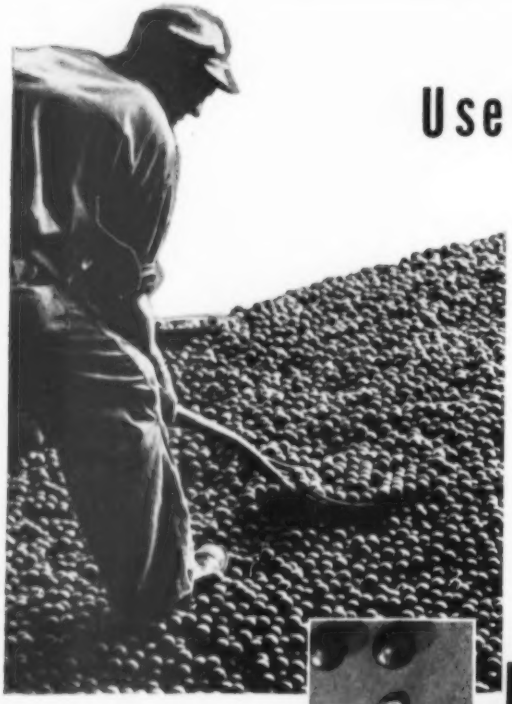
1. **No more rapping puffs.**
2. **Automatic operation—conveniently located remote control panel provides complete control plus surveillance.**
3. **No dampers in inlet and outlet of precipitator are necessary.**
4. **No sections need be taken out of service for rapping.**

HERE'S HOW IT WORKS: The new Research Corporation Magnetic Impulse Rapping System uses continuous, sequential, low intensity vibrations to keep thinner average coating on collecting electrodes. This method maintains optimum electrical conditions for continuous high efficiency dust collection. Ask your Research Corporation Field Engineer for complete data on this important new development, or write to us directly.

RESEARCH CORPORATION

405 Lexington Ave., New York 17, New York
122 South Michigan Ave., Chicago 3, Illinois
Bound Brook, N. J.

RC 141



Above—Ni-Hard balls being packed in drums for shipment to cement plants, from the Pennebacker Company.

Right—Pennebacker 1" diameter Ni-Hard balls sectioned to show soundness.

For Efficiency and Economy . . .
Use NI-HARD* GRINDING BALLS

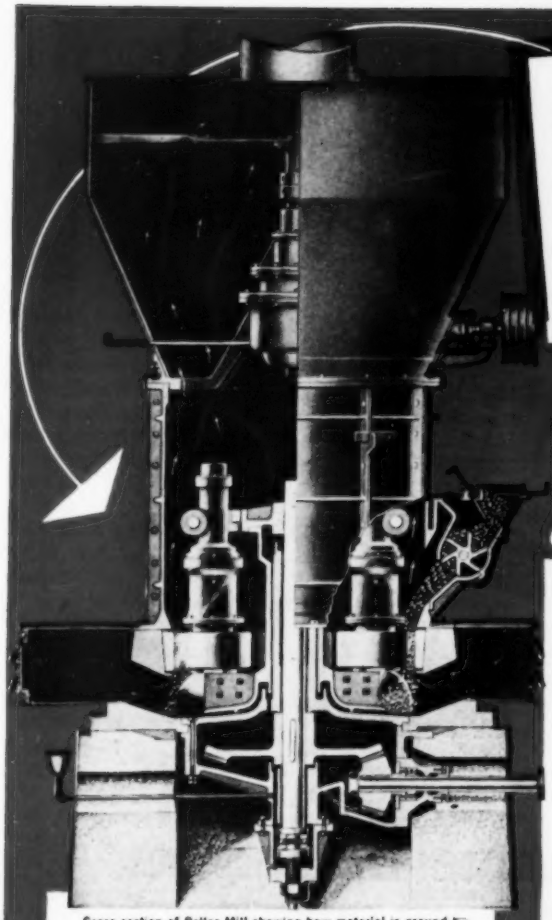
NI-HARD has amply proven its worth as grinding ball material in the cement industry. In dry grinding raw stone and clinker, balls of this highly abrasion-resistant metal have shown a superiority over hardened steel of up to 5:1. . . . They have given 50% longer life than hardened steel in wet grinding cement stone.

Ni-Hard balls are immediately available from Pennebacker stock in 1/2", 5/8", 3/4", 7/8", 1", 1 1/2", 2" diameters. Also Ni-Hard slugs are produced in the following sizes: 5/8" diam. x 1 1/4" long, 7/8" and 1", and 1" x 1 1/4".

Current stocks and facilities permit prompt shipment of all standard sizes. For special orders the Pennebacker foundry is at your service. Investigate your grinding media savings possibilities . . . today!

*Reg. U. S. Pat. Off., The International Nickel Co., Inc.

THE PENNEBACKER COMPANY
Emmaus, Pennsylvania
Authorized Producer of Ni-Hard



Cross section of Roller Mill showing how material is ground by rolls rotating against bull ring, then air swept to separator which extracts fines and returns coarse material to mill for regrinding.

Increase Your Output Of FINE GRINDING

...with greater uniformity
...at lower cost

WILLIAMS *Roller Mills*

Limestone, burned and hydrated lime, clays, kaolin, talc, gypsum — whatever the material, if it has to be finely ground, there's a Williams Roller Mill to do it — faster, for stepped up production — more accurately and uniformly —and at far less cost!

Automatic and continuous in operation, the Williams also dries and grinds simultaneously. Instantly adjustable for finenesses of 20 to 400 mesh, even down to micron sizes. No built-up cushions of "fines" can impair grinding efficiency because the constant upward air current carries ground materials to the air separator which discharges *all* finished materials and returns *only* the oversize product to the mill for further grinding.

Feeding rate is automatic and self-adjusting, positive and simple in action—Anti-friction roller and ball bearings reduce down-time for lubrication, save oil and put more power into grinding—Take-up for wear is continuous and automatic—Rugged forgings, electric steel and alloy castings guard against wear and breakdowns—These and many other outstanding features have made Williams Roller Mills the standard for fine-grinding operations.

Write For Catalog

OTHER WILLIAMS EQUIPMENT

HAMMER MILLS

"Super-Slugger" models, with capacities up to 550 tons per hour, that reduce power shovel loaded rock to 1½", ¾" or agstone in one operation.

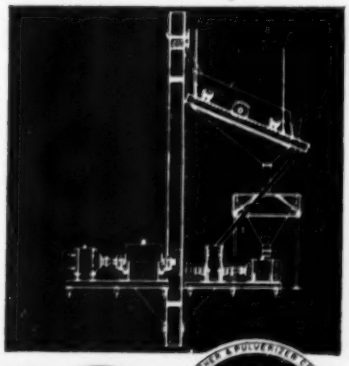
"Slugger" models, with capacities up to 100 tons per hour, that reduce "one-man" size stone to 1¼", ¾" or agricultural limestone in one operation.

Other models, with capacities from 5 to 200 tons per hour, for reducing 4" to 6" stone to ¾", ½" or agricultural limestone in one operation.

IMPACT and DRIER MILLS
AIR SEPARATORS
VIBRATING SCREENS

WILLIAMS COMPLETE PLANTS

Backed by years of know-how and experience, Williams can build any type of ready-to-install plant to handle crushing, grinding, air separation, sifting, conveying and magnetic separation including storage bins and electrical equipment.



WILLIAMS PATENT CRUSHER & PULVERIZER CO.
802 ST. LOUIS AVE. ☆ ST. LOUIS 6, MO.

WILLIAMS

CRUSHERS GRINDERS SHREDDERS

OLDEST AND LARGEST MANUFACTURER OF HAMMER MILLS IN THE WORLD

Here are the *BENEFITS of BENEFICIATION* by Flotation

BROADEN YOUR PRODUCTION
REVIVE YOUR QUARRY

Depending upon the composition of your "run-of-quarry" stone, the Flotation Process may enable you either to modify the analyses of the kiln feeds or to permit the practical substitution of other available components, and thus adjust the chemical ratios of your raw materials to broaden your production to include all five standard Types of cement (I-II-III-IV-V). It provides for the economical use of inferior limestones; materially lengthens the life of the quarry; and reduces costs by avoiding selective quarrying.

When properly integrated with the grinding and classification circuits, the Flotation Process usually involves a saving in power; and burning characteristics of the final compositions are improved. The total savings may more than offset the operating costs of flotation. The rejects of the process may be a saleable by-product.

Normally the Flotation Process can be installed in your plant without affecting existing equipment or interfering with your production schedule.

Each quarry involves special conditions, and special flow sheet requirements. Our laboratory and pilot plant are fully equipped to handle a thorough investigation of your materials. After this investigation, by mining and chemical engineers, trained in cement chemistry, we can design, equip, and supervise the erection of a complete raw-material plant, engineered to meet your individual requirements. Preliminary examinations are made without obligation on your part. Write us for detailed information.

SEPARATION PROCESS COMPANY
CATASAUQUA, PENNSYLVANIA

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S-9

Modernization Doubles Business For Crystal Silica Company

another P and Q exclusive

CRYSTAL Silica Company, Oceanside, Calif., has been working open-pit Cretaceous sand and gravel for more than a quarter-century. Wayne Harper, president, recalls that in the 1920's the bulk of silica sand used in this country came from Belgium as ballast in ships. Operating on a fixed policy of re-invested profits, Crystal Silica has built production steadily to a current volume of 200 carloads per month of fine high-grade, precisely-sized silica sand aggregates.

"In the beginning," recalls Mr. Harper, "we regarded one carload of sand as the payroll, the second carload as overhead, and the third carload as profit." Teamwork plus careful purchasing of equipment are the two "keys" to Crystal Silica's continuing success. The team includes Richard Harper, son of Mr. Harper; W. T. Borden, who has been superintendent of maintenance since 1931; Dave Borden, with the corporation since 1938; and Clinton Kite, general superintendent since 1938.

Crystal Silica has been supplying small amounts of glass sand since 1930. Today the company considers that 80 percent of production is being used in the building trades.

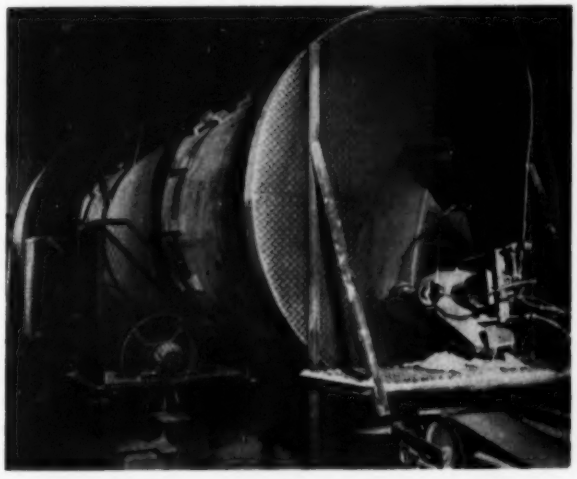
From 250 to 300 tons of silica sand per day leave the plant to be used in the building trades, by roofing companies, in water treatment operations, as gravel pack for oil wells, gunite sand and all sizes of blasting sand. Crystal Silica also supplies considerable sand for water filters to U. S. Naval Reservoirs in the Pacific. The company computes that it has supplied high-grade sand to 5 percent of the private beaches in the Los Angeles and Southern California areas.

The gunite sand has been job-tested by Macco Company for the Aluminum Corporation of America in 28-day strength tests. It was found that Crystal Silica gunite would not break down under pressure of 9,000 p.s.i. Ordinary sand will not survive pressures of more than 4,500 p.s.i. Officials believe the strength quality of this sand is based on the amount of colloidal silica present in the aggregate.

Recently Crystal Silica developed a market for "Kiddy Play Sand" which is 97 per cent sterilized. Another product is "Sani-Sand" for cats, shipped by the carload each month with a deodorant for keeping odors neutralized in the household.

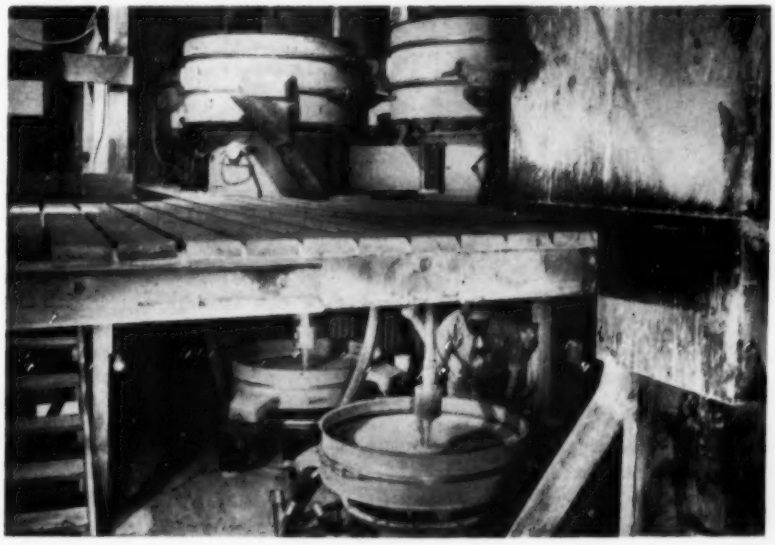
Raw material in the Crystal Silica pit averages 78 percent silica. At final analysis, the company finds 92-96 percent silica depending upon grade and size. This effective sizing and uniformity of individual prod-

(*Continued on page* 211)



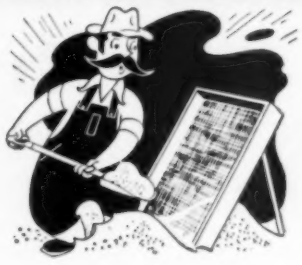
Right: The standard drying operation precedes screening.

Below, right: The Crystal Silica Company's screening room, showing the gravity feed from coarse (above) to fines (below). Six vibrating screen separators (48-in. dia. each) handle 30 tons of silica sand per hour with long screen life. Bob Lovell, screen room operator, will soon have three additional separator units for wider selection of fines.



W. T. Borden inspects the drive he designed for the dryer. The original pinion gear drive could not survive a heavy dryer load; so a nylon cord V-belt drive, which lasts much longer than gear, was installed.

Screenings



by William M. Avery

VIA a recent issue of the Lawrence *Dragon* we have just come into possession of a really plausible explanation of the cement shortage. The Farnsworth Museum in Rockland, Maine, had been holding an exhibit of products made by local industries, and one display showed the various stages by which limestone, clay, and other raw materials are transformed into portland cement. In attempting to explain the process to a group of students, a teacher paused momentarily when she came to a sample of clinker, then went on jauntily, "Oh, yes, clinker. That's waste material, I think. They throw it away."

Goat Idea

MICHIGAN Limestone has an odd, and apparently quite effective, method of stimulating interest in safety among the various departments of its huge plant at Rogers City, Mich. Any department which racks up a lost time accident gains immediate possession of a goat named Bill, and is saddled with the

chore of feeding and caring for the critter until an accident occurs in another department. We can see why this practice has a beneficial effect upon safety awareness among the men, but after a long stay in one department, we would expect the situation to become awfully damned hazardous for the goat.

Mountain to Mahomet

WE understand that a British firm is exporting custom-made mountains at around $5,000 per. Based on surveys and air photos, the plastic and plaster miniatures of famous peaks are said to be in considerable demand among mountain climbers and geologists. Just this moment a replica of a mountain doesn't show up on our list of things we've always wanted, but we're glad to add this bit of intelligence to our already vast accumulation of totally useless information.

So There!

SOMEBODY slipped the block industry a Mickey Finn with that libelous story about a new escape-proof jail in Algonac, Mich., that lost its first prisoner when the guy kicked loose the concrete units in one of the walls and sauntered away. Bet he couldn't have managed it if he'd been barefooted!

Good Old Unc!

WE UNDERSTAND that research workers in a Munich laboratory have succeeded in measuring the muscular energy of earthworms. They claim that the total output of worm power in a hectar (2½ acres) of timberland is equivalent to two horsepower. The news upset us a bit for a moment because it seemed like the sort of project some branch of our own Federal Government could have struggled with quite happily for 10 or 20 years. But then we had a reassuring thought. The odds are at least 10 to 1 that Uncle Sam financed the Munich job.

Perish the Thought

SOME months ago we wrote an article for our *Concrete Manufacturer* presenting some of the behind-the-scenes facts about the manufacture of concrete septic tanks. We gave it the following head: "Septic Tank Business Involves Far More Than Meets the Eye". In the first flush of creation it struck us as a pretty fair head, but when we noticed the article in print some time later we found an altogether new connotation. Either way you read it, anyhow, it's still true, we hope.

Military Coup

ARMY engineers have announced the discovery that beach sands can be made hard enough to sustain heavy military traffic by the application of blackstrap molasses. Dur-

ing that era when blackstrap molasses was widely prescribed as a tonic for small boys, we could have greeted this news with considerable enthusiasm, but just now it seems to have no pronounced effect save to boost us into the ranks of those "Born Thirty Years Too Soon". We do have a question, however: Has the army figured out how to *remove* the blackstrap molasses so that the beaches can be restored to such non-military activities as swimming, sun bathing, and wiener roasts?

By-Product

SOME sort of a record for larceny was set by the hardworking blokes who swiped 260,000 concrete masonry units from the Joseph M. Ripley Company of Jacksonville, Fla. Mr. Ripley might recover a small part of his loss by selling the story to Cousin Robert for his "Believe it or Not" column.

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WASHINGTON NEWS LETTER

By S. HERBERT UNTERBERGER

How the Budget Has Been Cut

SHORTLY before President Truman left office, he presented a budget to the Congress which recommended expenditures of $78,600,000,000 and estimated that receipts would be $68,700,000,000. This would have resulted in a deficit of $9,900,000,000.

President Eisenhower and his administration have been striving mightily to reduce expenditures. It now appears that their tremendous effort will accomplish a reduction in spending of about $4,500,000,000 or approximately 6 percent. Even this has been achieved only by eliminating governmental activities which are dear to the hearts of large numbers of citizens either because they supply the government with required goods and services or because they benefit directly from the government's program.

Since a significant part of government expenditures go into construction, the cutbacks will affect that industry and its suppliers very soon. Among the construction projects which are likely to be affected will be the following:

Federal power projects. The river valley projects will be curtailed substantially. Proposed government power plants will not be built. Money to extend government power transmission lines will be hard to find.

Hospitals. Federal aid in financing local hospitals has been cut by one-third. The budget for Marine and Public Health Service hospitals has been cut substantially. The funds recommended to build new research laboratories have not yet been appropriated and are unlikely to be.

The *Atomic Energy program* is expected to be cut back, particularly if the proposal to give private companies a chance in its development goes through.

Public housing. From present indications, the low-rent public housing program is likely to be eliminated completely.

In addition, many other government services are scheduled to be cut. The Commerce Department will be required to reduce its service of supplying business information, and the Labor Department will eliminate some of the work done by the Bureau of Labor Statistics. Farmers, too, will be affected by reductions in the services provided by the Agriculture Department and in the payments they receive under soil conservation and other programs.

As a matter of fact, practically every government service, from improving air safety to the postal service, is likely to be affected in some degree. The hope around Washington is that the forced economies will result in the elimination of the least essential or downright unessential activities. There is no guarantee that it will really work out this way. Unless Washington has altered its habits completely, survival depends on many other considerations besides essentiality.

How the Cuts Help Balance the Budget

While a second look at the budget revealed where $4,500,000,000 could be cut off the expenditures, it also showed that the receipts would probably be $1,200,000,000 less than expected. As a consequence, even after these hard-earned budget cuts have been made, the deficit is still likely to be in the neighborhood of $6,600,000,000.

It is this hard economic fact which prompted President Eisenhower to go to the Congress with his tax austerity program. It took much courage on his part to request—almost demand—that:

1. The corporate excess profits tax be extended beyond its June 30, 1953, expiration date.
2. There should be no decrease in the personal income tax before December 31, 1953.
3. The 5 percent decrease in the regular corporate income tax, scheduled for April 1, 1954, be repealed.
4. The decrease in excise taxes, scheduled for April 1, 1954, be repealed, pending further study of the whole excise tax structure.

It took much less courage to recommend postponement for one year of the increase, scheduled for January 1, 1954, in the old-age security tax from 1½ to 2 percent.

Even if these requests are granted, receipts would increase by only about $1,000,000,000. The budget would continue to be unbalanced to the extent of $5,600,000,000.

Unbalanced Budget and the Debt Limit

Failure to balance the budget leaves President Eisenhower with the very distasteful task of asking the Congress to increase the debt limit. Although the debt limit is completely arbitrary and in itself has no particular significance, a request to raise it can be made to appear like a violation of his campaign promise. That his political enemies will use this, as well as every other device, in the forthcoming campaign can be expected.

Prosperity and a Balanced Budget

Balancing the budget, the Eisenhower Administration has discovered, is not a simple matter of eliminating some obvious unnecessary and duplicating activities. It may be assumed that the new heads of departments were on the lookout for such situations in the six months since they took office. No really flagrant cases have been found.

It is clear by now that the only real hope of balancing the budget from the expenditures side is to effect a substantial reduction in military spending. The recent developments in Korea make this appear possible for the first time in many years. Before it is safe, however, a sustained period of space is required. Until our potential enemies fully demonstate their peaceful intentions, it will be unwise to shrink our military establishment again.

On the receipts side, there is absolutely no possibility of balancing the budget by raising taxes. The only hope here is that increasing prosperity will result in the present tax rates yielding higher tax income. This relationship between prosperity and a balanced budget is receiving increasing attention in Washington.

The Administration recognizes clearly that the fate of its program depends entirely on continued prosperity. It is unlikely that it would survive a serious business setback. So far, the Administration has no reason to be concerned. The industrial machine is operating at high speed and shows no evidence of slowing down. By now prosperity through 1953 appears assured. The real test is not likely to come until early in 1954. By that time the impact of budget cuts and the peace offensive will have been felt. As of now, official Washington seems to be completely sure that the economy will adjust to the new situation and that its Administration will have proved itself.

His wagon is hitched to a star...the DW10

The Russian River Gravel Co., Santa Rosa, Calif., hauls gravel and sand from a river to its plant—a half-mile round trip. To write its balance sheet in *black ink*, the haul has to be made quickly, economically and with big pay loads. That's why the job was given to a Caterpillar DW10 Tractor and W10 Wagon.

"I can operate my DW10 cheaper than I can my dump truck," explains Walter J. Doyle, owner. "To do the same amount of work would require two 5-yard dump trucks. Another thing, the DW10 handles nicely on loose material."

On the job, the DW10 is hauling more than 40 yards an hour. Gravel is sold for road work, sand for building.

The Cat* W10 Wagon is designed to help you haul fast. It hauls 8.9 yards struck, 14 yards heaped—and Mr. Doyle gets an average load of 10 yards. Its generous bowl provides an ample bull's-eye for shovel or dragline loading.

Dumping is speeded with a hydraulic ram which puts the operation under complete control of the operator. He can open the doors to any position whether the wagon is moving or stationary.

Let your dealer demonstrate these all-Caterpillar-built units. Designed as a team, tractor and wagon will give you the quickest, most dependable and productive hauling possible.

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A Comparison of Statute Requirements For Liming Materials in Various States

HAVING long suspected that there was little consistency or uniformity in the practice of the various states in placing restrictions upon the sale of agricultural liming materials, PIT AND QUARRY has just completed a telegram survey aimed primarily at determining what standards are imposed with respect to fineness and chemical analysis. Results indicate that at least 27 of the 48 states now have statutes which apply, or can be applied, to material produced by the agricultural limestone industry. In only six of the states (Delaware, Minnesota, North Carolina, Ohio, Virginia, and Wisconsin) do the existing statutes appear to set specific limitations upon the fineness of liming material, and of these states only one (Wisconsin) goes a step further by setting a minimum neutralizing value for "standard grade" material.

With the exceptions noted, most of the statutes now being enforced seem to require only that the producer provide information or a guarantee concerning the physical and chemical analysis of his material, without any reference to minimum or maximum requirements. In many cases the regulations appear to leave it to the discretion of the departments of agriculture to rule out substandard materials by refusing to register the brands. This type of policing is implied rather than stated, and it seems unlikely that it is ever used to impose hardships on the industry.

Below, under headings for each of the states for which information is available, are brief condensations of the various statutes as they apply to physical and chemical standards. The information indicates considerable need for standardization of the sieve sizes to be used in determining the fineness of agstone, and of the chemical properties to be used in evaluating neutralizing power.

ALABAMA

The only specific requirement the Alabama Department of Agriculture and Industries establishes as to fineness of limestone or dolomite is for that used in fertilizers, reading as follows: "When limestone or dolomite is used in a fertilizer or fertilizer material, the limestone or dolomite shall be crushed or ground to such a degree of fineness that all material will pass through a 10-mesh screen and not less than 50 percent of the material will pass through a 50-mesh screen."

No standards for fineness or analysis have been established under Alabama's Limestone Law. Hearings were held, but no agreement was even reached as to fineness under the law.

ARIZONA

The Arizona Agricultural Minerals Law does not mention fineness of grind but does require a percentage guarantee. Arizona soils (practically all irrigated lands) contain large quantities of $CaCO_3$, and little or no limestone is used as a soil amendment.

CALIFORNIA

California law requires that each agricultural mineral be registered before being offered for sale in the state and requires each container or lot be labeled with the name of the product as it is registered, a statement of the name and percentage of each constituent of agricultural value claimed to be therein and the minerals from which each constituent is derived, the name and address of the registered firm or person, the county of production, and the net contents. Additional information may be included if desired. The law does not require that the label show any information about fineness, nor are there any minimum specifications that must be met.

COLORADO

The volume of liming material consumed is not of sufficient amount in the state to require specific regulations pertaining to fineness or calcium carbonate equivalent. While production of limestone within the state of Colorado is high, consumption of agricultural limestone is slight, due to the soil characteristics of the region.

DELAWARE

The Delaware law applies to pulverized limestone (at least 90 percent through a No. 35 screen), limestone meal (at least 80 percent through a No. 10 screen), limestone screenings (at least 60 percent through a No. 5 screen), marl, shells, quicklime, ground lime, granular lime, run-of-kiln lime, kiln slakes, hydrated lime, spray lime, air-slaked lime, and any other material having a neutralizing value equivalent to 25 percent pure calcium oxide.

FLORIDA

In Florida there are no specific limitations set up by law. Ground limestone, if sold in the state, must be registered and tagged to show maximum percentage of moisture and minimum percentages of the following: Calcium carbonate ($CaCO_3$); magnesium carbonate ($MgCO_3$); passing 60-mesh sieve; passing 20-mesh sieve.

It is, however, within the province of the Florida Commissioner of Agriculture to accept or reject registrations of products of this nature where no definite limitations are set up by law or regulations. A majority of ground limestone guarantees are as follows: calcium carbonate ($CaCO_3$), 90 percent; passing 60-mesh sieve, 50 percent; passing 20-mesh sieve, 80 percent.

IDAHO

Although the state of Idaho has a fertilizer law which can be construed as applying to liming materials, there seems to be no tendency to so apply it at the present time.

IOWA

The Iowa Agricultural Limestone Law sets no limitations on either the physical or chemical analysis of liming material but requires that the manufacturer must state a guaranteed analysis for both package and bulk sales in terms of calcium carbonate equivalent and the percentages of the material which will pass the No. 50, No. 8, and No. 4 sieves. A 5 percent tolerance is allowed on both grades of fineness and calcium carbonate equivalents.

MAINE

A Maine law governing quality, purity, and registration of commercial fertilizers requires for such materials a chemical analysis showing the minimum and maximum percentages of calcium oxide and of combined carbonates. No limitations are indicated, nor is there any apparent reference in the law to fineness requirements. Where liming materials are sold in bulk, the statement regarding percentages is furnished only upon demand by the purchaser.

MARYLAND

The State Inspection Service of Maryland has no limitations affecting liming materials, but a state law requires manufacturers to supply the following information: the percentages of the material passing the 20-,

60- and 100-mesh sieves; and the minimum percentages of calcium oxide and magnesium oxide. The local office of PMA scales its payments in accordance with the fineness of material, basing the maximum upon 100 percent passing the 20-mesh screen.

MASSACHUSETTS

The Massachusetts Fertilizer Law contains no limitations regarding the physical character of agricultural limestone. The only chemical limitation is a clause to the effect that registration may be refused for a product containing less than 5 percent calcium oxide or 5 percent magnesium oxide.

MICHIGAN

The Michigan Department of Agriculture places no limitations on either the physical or chemical characteristics of liming materials. Manufacturers are required by law to furnish a guarantee of the nutritional value of agricultural limestone in terms of calcium carbonate.

MINNESOTA

The state of Minnesota has no law directly related to liming materials. However, the 1952 Fertilizer Bulletin includes the following pertinent definitions: Pulverized limestone (or fine-ground limestone) is the product obtained by grinding either calcitic or dolomitic limestone so that all the materials will pass a 20-mesh sieve, and at least 75 percent will pass a 100-mesh sieve. Ground limestone (or coarse-ground limestone) is the product obtained by grinding either calcitic or dolomitic limestone so that all the materials will pass a 10-mesh sieve, and at least 50 percent will pass a 100-mesh sieve.

MONTANA

Present statutes of the state of Montana apply only to those substances sold for fertilizing, manurial, soil enriching, or soil corrective purposes, which sell for $10 or more per ton. A bulletin entitled *Commercial Fertilizer Report for 1951* makes no reference to liming materials.

NEW JERSEY

An act to regulate the sale of agricultural lime in the state of New Jersey requires manufacturers to supply the following information: the minimum and maximum percentage of total lime and of total magnesia; and the minimum percentage of lime and magnesia combined as carbonates. No limitations are mentioned, and there is no reference in the statute to fineness.

NEW YORK

The Agriculture and Markets Law of the state of New York requires producers to provide statements regarding minimum percentages of

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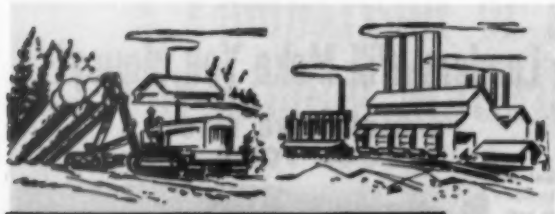

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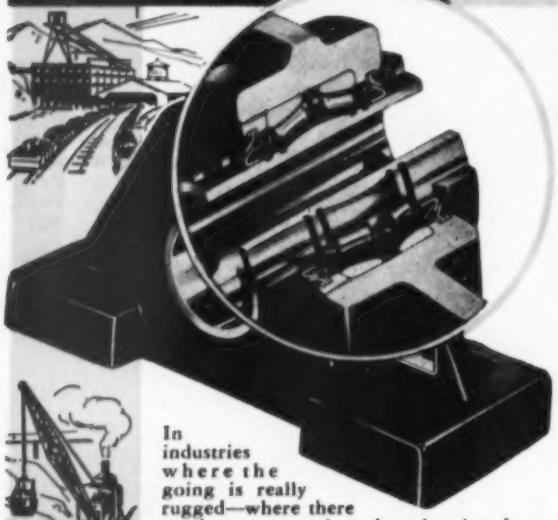

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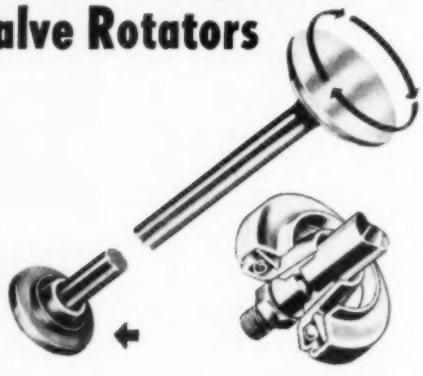

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Rotators are standard equipment on the Model B-125 and Model W-201 power units. They also can be installed easily and at low cost on any of the other Allis-Chalmers Power Units. For more power, at lower cost see your Allis-Chalmers Dealer.

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calcium oxide and magnesium oxide, as well as the percentages of the material that will pass through 100-, 60-, 20-, and 10-mesh sieves. No limitations are specified.

NORTH CAROLINA

The North Carolina Lime and Landplaster Law requires manufacturers to register each brand of material annually, and to provide a statement regarding the minimum percentages of calcium carbonate and of magnesium carbonate. A minimum screening standard adopted by the state Board of Agriculture in 1948 also requires that 100 percent of agricultural liming material must pass the 10-mesh screen, and 50 percent must pass the 100-mesh screen, with a tolerance of 5 percent in each case.

OHIO

The Ohio Law Relating to Sale of Agricultural Liming Material is quite specific in setting physical standards to be set. Various types of liming material are defined, as to physical analysis, as follows: agricultural superfine limestone or slag, 80 percent or more passing 100-mesh, and at least 95 percent through 60-mesh; agricultural pulverized limestone or slag, 60 to 75 percent passing 100-mesh, and at least 95 percent through 20-mesh; agricultural ground limestone or slag, 40 to 45 percent passing 100-mesh, and at least 95 percent through 8-mesh; and agricultural limestone or slag meal, 20 to 35 percent passing 100-mesh, and at least 80 percent through 8-mesh. Agricultural limestone screenings are further defined as any materials coarser than those specified above.

The manufacturer of liming materials is required to provide a statement of guaranteed analysis in terms of minimum percentages of calcium and magnesium, and of the total neutralizing power in terms of carbonate as well as the minimum percentages of the material that will pass the 100-, 60-, 20- and 8-mesh sieves.

OREGON

An Oregon law relating to Regulation of Fertilizers, Lime and Agricultural Minerals requires producers of liming materials to provide information regarding the guaranteed minimum percentage of calcium oxide or carbonate, the maximum percentage of magnesium oxide or carbonate, the minimum total neutralizing power expressed in terms of calcium carbonate, and the percentages of the material that will pass the 100-, 50- and 10-mesh sieves. No limitations are specified.

PENNSYLVANIA

The Pennsylvania Lime Law applies to all liming materials for agricultural purposes "except to producers of not over 100 tons per year made at quarry or pit in bulk to the trucks or wagons of the users". Producers subject to the law must provide information regarding the percentages of their material passing the 20-, 60-, and 100-mesh sieves, the minimum percentages of calcium oxide and magnesium oxide, and the maximum percentage of calcium oxide and magnesium oxide combined as carbonates. No limitations are specified.

RHODE ISLAND

Rhode Island places no limits on the particle size of liming materials sold in the state. Registration is required with the Bureau of Markets, and labels must appear on each bag showing brand name, net weight, name and address of manufacturer, and minimum guarantees for calcium oxide, magnesium oxide.

UTAH

Utah has no legal requirements for physical condition of agricultural limestone sold in the state. Such products must be registered as fertilizer materials and from a chemical standpoint show a minimum guarantee for calcium carbonate ($CaCO_3$) and calcium oxide (CaO) equivalent.

VERMONT

The Vermont law defines agricultural lime as "all the various forms of lime intended and sold for fertilizing purposes". Each lot or parcel of the material must be accompanied by a statement regarding the minimum percentages of total lime, total magnesia, and lime and magnesia combined as carbonates. In the case of bulk shipments, the statements must be affixed to the vehicles used. No limitations are specified.

VIRGINIA

Manufacturers of agricultural liming materials in the state of Virginia must provide an analysis of their material stating the minimum percentages of calcium carbonate and of magnesium carbonate in unburned products, and the minimum percentages of calcium and magnesium oxides and carbonates in mixtures of burned and unburned forms. Minimum screening standards are as follows: for agricultural pulverized limestone, 100 percent passing 20-mesh and 75 percent passing 100-mesh; for agricultural ground limestone, 100 percent passing 10-mesh and 50 percent passing 100-mesh; and for agricultural coarse-ground limestone, 100 percent passing 10-mesh, and 30 percent passing 100-mesh. Tolerances of 10 percent are allowed in all cases.

WASHINGTON

Effective January 1, 1954, the laws of the state of Washington will require producers to provide a statement regarding the guaranteed minimum percentage of calcium and/or magnesium expressed as their carbonates, the minimum total neutralizing power expressed in terms of calcium carbonate, and the percentages of material which will pass the 100-, 60-, and 10-mesh sieves.

WEST VIRGINIA

The State Lime Law of West Virginia requires that agricultural lime be labeled to show the percentages of calcium oxide, magnesium oxide, and calcium carbonate equivalent. All ground limestone must be labeled to show the percentage passing the 20-, 60- and 100-mesh sieves. There are no minimum limitations.

WISCONSIN

The Wisconsin law sets forth requirements for Grade A, Standard Grade and Sub-Standard Grade agricultural lime as follows:

Grade A agricultural lime designates a product of which at least 90 percent passes a standard 8-mesh sieve and either at least 50 percent passes a standard 60-mesh sieve or at least 30 percent passes a standard 100-mesh sieve and has a minimum neutralizing value of 85 percent. Standard grade agricultural lime designates a product of which at least 80 percent passes a standard 8-mesh sieve and either at least 35 percent passes a standard 60-mesh sieve or at least 20 percent passes a standard 100-mesh sieve and has a minimum neutralizing value of 80 percent and gives a figure equal to or in excess of 0.72 when the percentage neutralizing value expressed decimally is multiplied by the percentage expressed decimally, passing an 8-mesh sieve. Substandard grade agricultural lime designates a produce which does not meet the minimum specifications of "standard grade agricultural lime."

Nebraska Limestone Plants Increase Grinding Output

At Weeping Water, Nebr., the Western Limestone Products Company, Inc., which lost its grinding facilities in a fire last February, is building a modern plant. The new mill, it was stated, will have a capacity of 55 tons of ground limestone and 47 tons of shell grits per day.

Another producer at Weeping Water is the United Mineral Products Company, whose new plant began operations in June, 1952. Present capacity is 120 tons of ground limestone per 10-hour day. Expansion plans envision increasing output to double the present rate.

CEDARAPIDS *DOUBLE*
GIVE THE CEMENT INDUSTRY GRE

Quarry run material reduced to minus 3″ at 500 tons per hour

The Inside Story
OF DOUBLE IMPELLER IMPACT BREAKER PRODUCTION

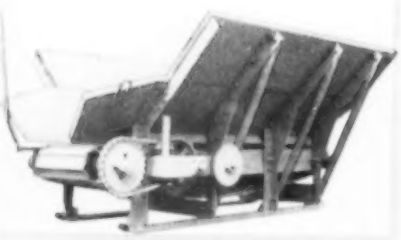
Approximately 50% less contact of stone on metal, because such a high percentage of material is broken in suspension. Extremely high ratio of reduction at very low power costs.
Minimum amount of accessory equipment such as secondary crushers, conveyors, hoppers, screens, elevators, etc

THE extremely high ratio of reduction of Cedarapids Double Impeller Impact Breakers is a big factor in cutting production costs for crushing limestone or shale for cement manufacturers. Much accessory equipment such as secondary crushers, screens, conveyors, bucket elevators and hoppers can be eliminated. Power requirements are consequently reduced, maintenance is simplified, production is increased.

A large Midwestern cement company has a 5360S Double Impeller Impact Breaker for primary crushing of shale and is reducing quarry run material to minus 3″ in one operation. Another 5360S Double Impeller averaged 600 tons of crushed limestone per hour with a peak production of 724 tons an hour. Dozens of other installations are proving the superiority of the Cedarapids Double Impeller Impact Breaker on some of the toughest reduction jobs you ever saw.

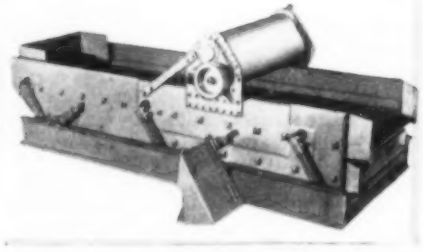
The big feed opening will take material up to 53″ in diameter. Pieces of material are hurled by the impellers against steel breaker bars, scientifically placed around the breaking chamber. Pieces glance off these rounded bars immediately. Can't jam or pack under normal conditions. As the material hurtles through the breaking chamber it collides with other pieces causing further reduction. Once the material leaves the impellers, it continues to be broken without using any extra horsepower.

For complete details about the Cedarapids Double Impeller Impact Breaker, see the Cedarapids distributor nearest you or write for the Double Impeller Bulletin.



CEDARAPIDS FEEDERS
Cedarapids Apron Type or Reciprocating Feeders control the feed, prevent choking and provide a smooth, workable flow of material to crushers, conveyors and bucket elevators, eliminating overloads and surges. Available in a wide variety of sizes for all types of aggregate or bituminous mixing plants. (Bulletin FE-1)

HORIZONTAL VIBRATING SCREENS
More efficient *horizontal* screening action, highly accurate graduation and large capacity combined to give you faster and more profitable screening at lower cost. Sizes range from 3′ x 8′ to 4′ x 14′ in double or triple deck styles. (Bulletin CS-1)



MOTORIZED HEAD PULLEYS
Here's a money-saving departure from conventional conveyor drives. With Motorized Head Pulleys, *everything* is contained inside the drum, completely protected from grit, dirt and weather, with no outside parts or motors to service. 70% to 90% of conveyor trouble and downtime eliminated when you convert your belt conveyor or belt-bucket elevator installations to motorized efficiency! (Bulletin MP-1)

IMPELLER IMPACT BREAKERS
ATER REDUCTION IN ONE STAGE

Cedarapids
Built by IOWA

Headquarters for
COST REDUCING EQUIPMENT

IOWA MANUFACTURING CO.
Cedar Rapids, Iowa, U.S.A.

Variety of Industry's Problems Discussed at N.I.S.A. Annual Meeting

THE National Industrial Sand Association held its 18th annual meeting at the Homestead, Hot Springs, Va., from May 13 to 15, 1953. The meeting, attended by some 85 members, wives, and guests, was

By KENNETH A. GUTSCHICK

another highly successful affair. It was featured by a number of interesting and informative informal discussion sessions, dealing with such important industry matters as percentage depletion, traffic, engineering problems, labor relations, and the business outlook. In addition, T. C. Waters, N.I.S.A. counsel, discussed insurance coverage in the industry, and Theodore F. Hatch, research adviser, Industrial Hygiene Foundation of America, spoke on the subject of the dust problem in American industry.

Important developments of the three-day session included the formation of an advisory committee on health and also one on labor. In addition, a special session was held by the committee on abrasives.

The meeting, as usual, was well-balanced with social activities. Besides the usual golf tournaments for members and wives, the group held a very successful dinner one evening, which was followed with excellent color movies taken at recent meetings by Clarence R. Wolf, association vice-president, and Nanko Bos. It is expected that the banquet will be repeated at future meetings.

Left: William J. Cannon, G. W. Cannon, Sr., and G. W. Cannon, Jr., all of the Nugent Sand Company, Muskegon, Mich.

Right: Norman H. Crissey, Wedron Silica Company; E. J. Campbell, Sun Sand Company; and F. C. Wachter, Pennsylvania Glass Sand Company. Mr. Crissey spoke on percentage depletion and labor relations.

Re-elected officers of N.I.S.A. are: Emery M. Durstine, treasurer; C. M. Hardy, president; and Clarence R. Wolf, vice-president.

Welcoming Address The meeting began with a brief welcoming address by C. M. Hardy, president of N.I.S.A. Mr. Hardy stated that in the association's 18-year history, the producers, by working together closely, have made it a very worthwhile organization. He expressed words of thanks to Vincent Ahearn, executive-secretary, and his staff, for expert guidance in the association's affairs. Mr. Hardy also paid tribute to 19 former members of the association who passed away during the last several years, most recent of whom was Dwight E. Manley, Manley Sand Company, Rockton, Ill. Mr. Manley died on April 3, 1953.

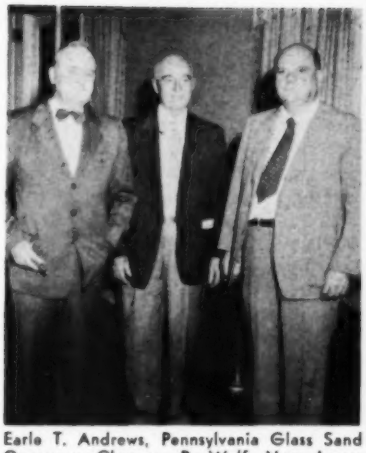
Percentage Depletion During an informal discussion on percentage depletion, in which there was wide audience participation, it was emphasized that benefits derived from percentage depletion allowances are of outstanding importance to producers, perhaps being of even more value than a single customer. In view of the fact that percentage depletion for nonmetallic mineral producers can be taken away, members were urged to fight continually for depletion allowance, principally by contacting their congressmen and proving to them the need for percentage depletion.

Several members related recent experiences with percentage depletion claims. Arthur B. Schlesinger (New Jersey Pulverizing Company) read a letter from his accountants which referred to preliminary decisions made by an agent of the Treasury Department who audited his company's accounts for 1951. According to the letter, the agent tentatively concluded that pulverization and bagging costs should not be included as a part of gross income and that therefore they are not deductible items. However, the decision was far from final, pending precise official interpretation as to what constitutes "ordinary treatment processes". Two other producers, in discussing recent audits of their books, expressed uncertainty as to whether costs of drying and bagging would be considered as part of gross income.

Norman H. Crissey (Wedron Silica Company and also affiliated with the Chicago Brick Company) discussed recent developments in the application of percentage depletion in the brick industry. Mr. Crissey mentioned that, unfortunately for the industry, some brick producers are actually unaware of the existence of the percentage depletion regulation.

It was brought out during the discussion that the percentage depletion committee will continue to represent the association on percentage depletion problems which may develop and that the committee has authority to litigate on behalf of the association or to consult with the board of directors or the association regarding possible litigation in the future.

The members were also notified that as soon as the final percentage



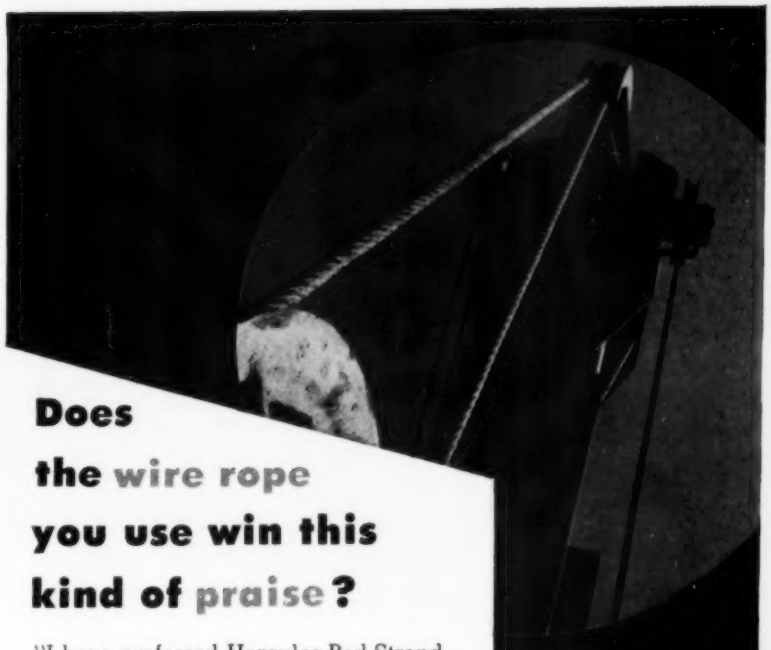
Earle T. Andrews, Pennsylvania Glass Sand Company; Clarence R. Wolf, New Jersey Silica Sand Company; and T. C. Waters, association counsel, who spoke on insurance coverage.

depletion regulations are issued, the percentage depletion committee will meet in Washington simultaneously with the National Sand and Gravel Association percentage depletion committee. The regulations, along with analysis made by the committee and John T. Sapienza, N.I.S.A. taxation counsel, will then be sent to the members.

Business Outlook Views of the members on the business outlook for the remainder of 1953 were varied. Whereas many companies looked for small to considerable decline from last year's high production, other producers expressed optimism, stating that their production would equal or possibly exceed previous totals. Competition from artificial sands, the questionable international picture, and the federal budget appeared to be main factors creating pessimism among certain producers.

Railroad Car Supply A discussion on railroad car supply revealed that in general the car situation is improving. Supplies of gondolas, hopper cars, and box cars appeared to be adquate for the remainder of 1953, although box cars may be short during the fall in the West. Covered hopper cars, on the other hand, are expected to be short in supply, particularly during the summer. As one consequence, the demurrage rates on covered hoppers has been increased, effective May 16 to July 1.

In anticipation of a survey to be made by the association this year on the cost of cleaning and repairing railroad cars, the members were asked to begin keeping detailed cost data on cleaning operations. This data is to form the basis of the



Does the wire rope you use win this kind of praise?

"I have preferred Hercules Red-Strand wire rope since 1909," says an operations superintendent. "I just wouldn't use any other." Another operator reports a truly remarkable record: "Red-Strand outlasted any other rope by three times!"

HERCULES Red-Strand *earns it*

Why do these men, among others, praise Red-Strand so highly? In a few words, it's because *higher-than-rated quality* in Red-Strand wire rope means *longer-than-expected* service . . . year in, year out.

Next time, use Hercules Red-Strand. You'll experience the difference too.

HERCULES® Red-Strand wire rope made by A. Leschen & Sons Rope Company, St. Louis 12, Missouri

In business only to make wire rope . . . better wire rope . . . since 1857

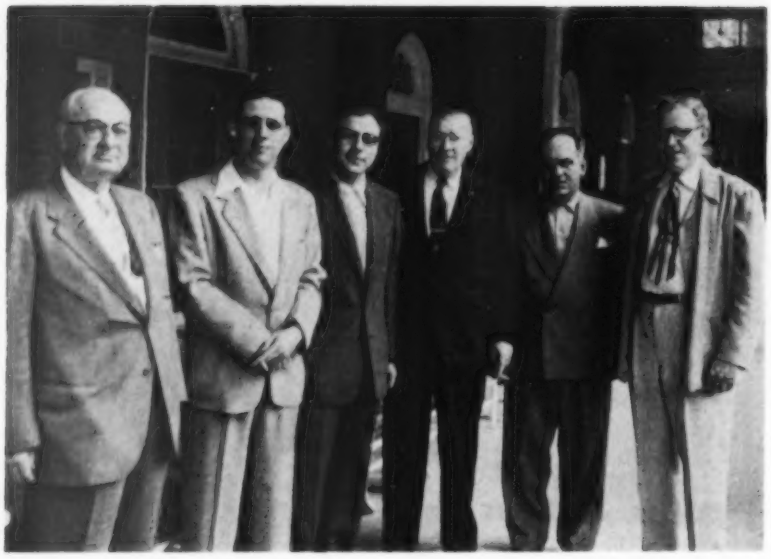
HIGHER-THAN-RATED QUALITY

LESCHEN

WIRE ROPE AND SLINGS

A. LESCHEN & SONS ROPE COMPANY

DISTRIBUTORS IN ALL PRINCIPAL CITIES



Left to right: Junius M. Strouss, George Coleman, Jack Newhouser, Harte Campbell, Lewis Fitzgerald, and Arthur Hinson. Mr. Campbell (Sun Sand Company) was elected to the board.

John Putnam, National Silica Company; Clayton F. Devine, Silica Sand Traffic Association of Illinois; and Mr. and Mrs. Ralph Lebold, Michigan Silica Company.

Luncheon scene at the Homestead. Left to right: Mrs. Arthur B. Schlesinger, Mr. and Mrs. T. F. Hatch, Clarence R. Wolf, and Arthur B. Schlesinger.

N.I.S.A. report to the Association of American Railroads.

Traffic William W. Collin Jr., N.I.S.A. traffic counsel, discussed the final tariff decision in the closed car case, which became effective May 2, 1953. The tariff calls for the reduction in the differential between closed-car and open-car tonnage rates, thereby effecting considerable savings to industrial sand users. The net effect of the new tariff is an approximate 50-cent reduction per ton of sand in closed cars for distances exceeding 100 miles.

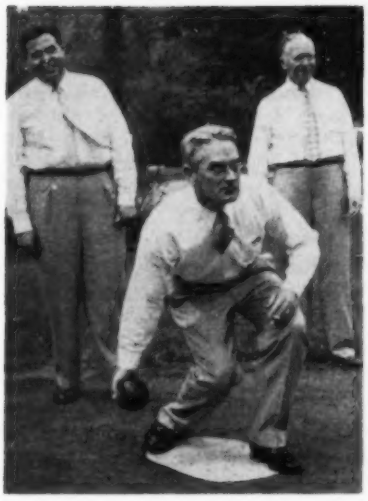
The new tariff changes all rates on sand in closed cars, making them 15 percent higher than open-top cars for runs up to 300 miles, and 10 percent higher for distances over 300 miles.

However, Mr. Collin pointed out that the railroad carriers in publishing these new rates have made them subject to old divergent increases under Ex Parte 175. These provide for a 12 percent surcharge on sand in open cars, and 15 percent in closed cars. Thus the closed-car rate is actually 18 percent higher than the open-car rate. Because this surcharge is seemingly illogical, a petition will be filed to limit the closed-car surcharge to 12 percent, the same as for open cars.

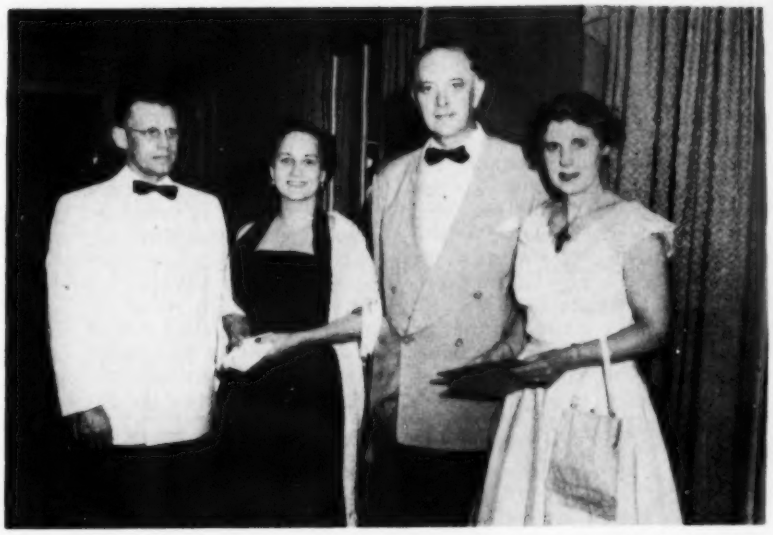
Insurance Coverage Theodore C. Waters, association counsel, gave an interesting talk on recent developments in the industry with reference to insurance coverage, particularly for occupational disease. He discussed in considerable detail recent legislation and company policies concerning occupational hazards and the compensation of employees who develop occupational diseases.

First Mr. Waters reviewed legislation or pending legislation on industrial health (particularly silicosis) in West Virginia, New Jersey, and Oklahoma. He expects that these states are soon to be followed by other states in the development of vigorous industrial health codes, which will be subject to strict enforcement. These codes will result in health officials making regular plant inspection trips to detect occupational hazards. If hazardous conditions exist, the plants may be subject to closure until the hazardous conditions are eliminated. Mr. Waters warned that this strict enforcement by state officials is not too far off, especially for some states. Consequently he urged producers to check plant operations carefully and to remove any grievous conditions that may exist.

He mentioned that one state (New Jersey) has set up the following max-



Lawn bowling was one of the many types of recreation. Here are (left to right) Robert R. Coxey (Industrial Silica Corporation), Edward Sawyer (Ayres Mineral Company), and A. Warsaw (Wedron Silica Company) enjoying the game.



Mr. and Mrs. W. D. Chadwick (Manley Sand Company) and Mr. and Mrs. Nanko Bos (John N. Bos Sand Company). Mr. Bos was elected to the board.

imum allowable concentration of free silica in a plant operation: if SiO_2 content exceeds 50 percent, the limit is 5,000,000 particles per cu. ft. of air; if 5 to 50 percent, 20,000,000 particles; and if less than 5 percent, 50,000,000 particles.

Elimination of occupational hazards will reduce disability claims and insurance rates, which will ultimately benefit the entire industry he stated. And above all, he added, it will be a valuable step forward in the often neglected field of human engineering.

In concluding, Mr. Waters briefly touched on other forms of insurance coverage, such as fire, public liability, and others, stating that producers should be adequately insured in all respects.

Committee on Health Because of the seriousness of the industrial health problem, Mr. Waters recommended that the N.I.S.A. form a special committee on health, which will investigate occupational hazards and develop effective methods of control. As a consequence, C. M. Hardy, association president, appointed the following men to the advisory committee on health: Earle T. Andrews (chairman), Nanko C. Bos, Russell J. Cronenweth, Sterling N. Farmer, Arthur F. Harrison, Jesse T. Morie, Edward N. Shaw, and George A. Thornton.

Dust Problem The association was once again fortunate in having Theodore F. Hatch, research adviser, Industrial Hygiene Foundation of America, Pittsburgh, who has spoken at previous N.I.S.A. meetings, as a guest speaker. In his talk on *Significant Aspects of the Dust Problem in American Industry*, Mr. Hatch first discussed recent developments in the fields of dust control and then gave some recommendations for attacking the problem. He first reviewed recent meetings he attended, including one in Sidney, Australia, which brought out how little is actually known in the field

A foursome of golfers: Arthur F. Harrison, Central Silica Company; Emery M. Durstine, Keener Sand & Clay Company; Sterling Farmer, Sand Products Corporation; and Charles Gorsuch, Ayers Mineral Company.

Other golfing enthusiasts included Gene Mason, Clayton Silica Company; Ken Gutschick, Pit and Quarry magazine; Ted F. Hatch, Industrial Hygiene Foundation of America; and Jesse T. Morie, Jesse S. Morie and Son, Inc.

of occupational diseases resulting from dust inhalation. He stated that chest X-rays have been proven inadequate for diagnosis of silicosis and thus actually represent only one tool in the study of lung damage.

Mr. Hatch emphasized that the dust problem remains a serious one in the United States, and suggested that producers begin immediately to adopt effective policies to solve the problem. He related what an excellent job had already been done in the Broken Hill mining district of Australia, stating that both national and local government co-operated with the mining industry in studying and combating the problem.

In discussing ways of solving the ever-continuing dust problem, the speaker strongly stated that the matter should be of prime concern to *top management;* you cannot buy a complete solution unless that group backs the dust control methods to the hilt, he added. In some cases it may even mean redesigning the entire plant. Mr. Hatch also expressed the view that there has been a tendency for producers to spend too much money on ventilating systems, rather than on process equipment; he felt that more effort should be devoted to building dust out of the equipment.

In conclusion he urged the industry as a whole to take the lead in solving the dust problem. Each member should discover his own dust hazards before the state health or labor officials do so, he added. Mr. Hatch felt that the formation of an advisory committee on health would be one of the wisest steps that could be taken by the association.

Stanton Walker's Report In making his annual report, Stanton Walker, consulting engineer for N.I.S.A., discussed *Problems of Production, Specification, and Use of Industrial Sand.* At the outset he stated that the industry, although relatively small, covers quite a diverse field and consequently involves a variety of technical problems.

In considering foundry sands, Mr. Walker stated that current problems include substitution of "synthetic" sands for naturally bonded sands; more efficient reclaiming processes; plastic molds; permanent molds; evaluation of different sands and the subsidiary questions having to do with cleaning castings, dust control, steel shot, and other substitutes, etc.

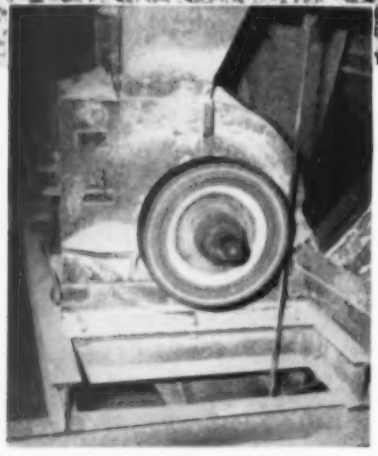
On the subject of standard specifications for foundry sands, Mr. Walker stated that many specifications are not feasible except in a general way. "There is a great variety in the nature of the work to be performed and in the materials with which to perform it," he declared. "The buyer of the sand determines what he wants and seems to be able to adapt himself to a considerable range of materials. His idea of what he wants is based importantly on what his past experiences have been."

However, he added that producers are confronted with certain tests for the evaluation of foundry sands. He pointed out that although these tests help maintain control both on the part of the producer and consumer, they are not as good as could be desired, particularly with regard to reproducibility. Mr. Walker thought that perhaps the association should review the test methods already developed.

On the subject of abrasives, Mr. Walker pointed out the serious problem created recently by the competing product, slag grits. The main problem centers around dust hazards resulting from abrasive blasting operations. He stated that there is some need for standardizing specifications for sand abrasives already existing, and added that no specifications have been developed for blast sand for cleaning steel plate. Mr. Walker then related recent activities

(*Continued on page* 211.)

WIN TWO WAYS *WITH* EAGLE



Actual installation photo of 16 x 24 hammermill at Spero, Ohio. Larger units up to size 36 x 42 hammermills. Eagle also makes jaw crushers and truck-mounted loaders.

(1) Higher quality aggregate brings premium prices . . .

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Eagle hammermills are known for their excellence on both points. Simple facts like these have led to gratifying repeat orders from leading producers.

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More Information, Please

CHECK AND MAIL THE CARD BELOW FOR ADDITIONAL INFORMATION ON NEW MACHINERY AND SUPPLIES

1. HELP HAPPY? One way to keep them happy is to give them good shower facilities. *Bradley Washfountain* tells how you can do this while saving both space and fixtures in the shower room.

2. PNEUMATIC CONVEYING of granular or broken bulk materials, using pressure or vacuum, is discused in this illustrated *Holly Pneumatic* booklet. One man operates this dustless, flexible system, tailored to the individual plant.

3. LIGHTWEIGHT PIPE for many applications in this industry—water and air lines, ventilating, dredging, cement pumping, etc.—is described in this handy *Naylor* technical bulletin.

4. FANS for ventilating, heating, and other uses in our field are discussed in detail in a 32-page *New York Blower* engineering data booklet, a helpful reference for you.

5. CENTRALIZED LUBRICATION is a vital ingredient in modern, efficient plant operation, says this 20-page *Farval* booklet, which shows how automatic centralized lubrications systems operate, and how they can save you money.

6. NEW DIESEL ENGINE gives four-way profits says this *Mack* bulletin, describing the fuel, operating, safety and maintenace economies of the END-673 engine, a 6-cylinder model designed for vehicles doing rugged duty in quarrying and haulage.

7. RECOVERY OF FINES and the principles of sand classification are discussed in an illustrated *Wood* Auto-Vortex classifier brochure that describes the economies of automatic, hydraulic action for separations from 10 to 300 mesh.

8. FLEXIBLE COUPLINGS, lubricated-type are essential to modern power transmission says "Lubrication", a magazine issued by the *Texas Co.*, in an interesting study of the various types of these important parts of our machinery.

9. VARIABLE SPEED rotary power (constant torque) can be applied efficiently and economically with hydraulic vane motors says this *Vickers* brochure. The motors range from 5 to 28.5 hp. with speeds from 1200 to 1800 rpm.

10. CENTRIFUGAL COMPRESSORS to deliver large volumes of air or gases are described in detail in this *American Blower* bulletin on its single stage models, 30 to 600-hp, with pressures from 1¼ to 3¾ lbs.

11. A NEW METHOD for lubricating machinery—the new *Alemite* oil-mist automatic lubrication system is described in a 12-page booklet on this new continuous lubrication system.

12. STOP DAMAGE in crushers, screens and elsewhere with an *RCA* metal detector, which spots tramp metal on the conveyor belt, literally "yells" for its removal and pays for itself in money and down time saved, this bulletin points out.

13. AIR POLLUTION from cyclones, rotary dryers, kilns, mixers and pulverizers can be stopped with the Liquid Precipitator "Multiple Action" scrubber says this *Johnson-March* brochure. The unit incorporates six different principles to remove large volumes of dust. Capacities range from 8,000 to 48,000 cfm.

14. DERRICKS FOR EVERY NEED are described in this *Clyde* bulletin, which gives uses, capacities and other valuable data.

15. ROCK AND SAND DRYERS, ruggedly built, with low fuel consumption and maintenance needs, are described in this *Standard Steel* brochure.

16. CASTINGS? NO WAITING! Thousands of standardized castings in iron, semi-steel and non-ferrous metals—with all sizes, shapes and forms available without patterns—are illustrated in this *Myerstown Foundry* catalog.

17. TILTING TRAILERS that carry equipment quickly from place to place are described in a *Miller Research* bulletin. One man can load these handy units in safety.

18. POWER PLANTS to produce standby or continuous AC or DC power from 500 to 35,000 watts, using water or air-cooled engines from one to 100-hp, are described in detail in this *Katolight* data sheet.

19. CASE HISTORIES of the use of rubber products in quarrying and allied industries are presented Sunday supplement fashion in a highly illustrated *Boston Woven Hose* brochure on hose, conveyor belts, V-belts and tape.

20. CIRCUIT BREAKERS cut downtime and maintenance actual case histories show in this booklet on the *Westinghouse* AB-1 circuit breakers.

21. ENGINE COOLING in relation to the requirements of the work being done improves the overall performance of your engines and cuts costs, says this bulletin on the *Schwitzer-Cummins* thermatic fan drive, which replaces the conventional constant fan drive on several popular industrial engines.

22. CRANE-EXCAVATOR, the *Wayne* model 20, self-propelled one-man op-

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July, 1953

PIT AND QUARRY:

Please send more information on items circled.

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TITLE

COMPANY

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CITY STATE

More Information, Please

erated with single-engine power and four-wheel drive, lifts 10 tons, handles buckets larger than ½-yard with ease, swings at 6½-rpm.

23. TRACTOR THAT'S YEARS AHEAD is the way *Oliver* describes its new OC-18 133 drawbar hp crawler, with "easy operating" features and air steering.

24. "LIFE LINE", the story of wire rope, what it does and what it is, is interestingly told in a picture-story tour of the *Macwhyte Co.*

25. KILN OPERATORS will be interested in this new bulletin about Thermalloy heat-resistant castings used as kiln ends, nose rings, feed pipes and dampers, and showing the new *Electro-Alloys Division* kilns at Basic Refractories' Maple Grove plant.

26. PORTABLE BELT CONVEYORS that can handle up to 340 cu. yds. an hour are described in an *Atlas* bulletin on heavy-duty units 20 to 60 feet in length, with 18, 24 or 30-in. belts.

27. CORROSION? It's all over the place! A new substance that can be made into pipe (threads and all) one-sixth the weight of steel, or sheet-fabricated parts for many uses, may be an answer to your problem. *Boltaron 6200* offers interesting possibilities.

28. WIRE ROPE HINTS—An A to Z compilation of uses and specifications, 22 pages long, may help you save money by showing the right type of rope for a particular use. *(American Chain & Cable Co.)*

29. THIS WILL AMAZE YOU! A new steel-hardening treatment to give rockbits a new lease on life lets you run them three to five times longer without dulling says *Doughty Labs.* The compound can be used to case harden conveyor rolls, wheels, pins, tools, etc. as well.

30. ELECTRIC CABLE designed especially for the heavy-duty needs of our industry is described in a 24-page *GE* brochure. Surface, aerial and underground cable for power, telephone, blasting and other purposes is described.

31. DOZERS in 15 models, cable and hydraulic, and three control units for Allis-Chalmers tractors are described in this new *Gar Wood* bulletin, with cut-aways, engineering drawings, detailed and on-the-job photos.

32. HOSE CARE TIPS are given in a helpful new bulletin from *Hewitt-Robins.* Mighty useful to pass around among your men, and thus protect your hose investment.

33. METERS AND CONTROLS are vital in modern installations. This 16-page *Bailey* bulletin tells how to use them for better plant performance.

34. ELECTRIC MOTORS for use where wetness or humidity is a problem are shown in this *Marathon* bulletin on its polyphase induction squirrel cage motors.

35. WATERTIGHT CONDUIT, flexible as well, to protect electric cable is first of its kind to get Underwriters' approval for wet locations, says this *American Metal Hose* bulletin.

36. SECTIONAL BELT CONVEYORS and grit-proof idlers, imported from abroad, by *Hambro,* are described in this comprehensive 20-page bulletin.

37. MULTIWALL BAG STORAGE can help you, or hurt you. *Hudson* gives you valuable tips on how to do it properly in this bulletin.

38. NEW BELTING for conveyors, developed in England and made in North Carolina, is described in this *Scandura* booklet. A core of solid-woven, multiple plies coated with plasticised PVC features the belting.

39. TRAP TRAMP METAL to produce purer products or reduce the danger of damage to expensive machinery. Check-card for details.

40. RECENT DEVELOPMENTS in the revolutionary field of low hydrogen electrode welding are discussed in an interesting new 8-page technical *Alloy Rods* bulletin.

42. BAG PACKER AND CLOSER for packaging pre-weighed charges of free flowing products in multiwall open-mouth paper or textile bags, 25 to 100-lb. sizes, is described in this *Bemis* bulletin.

43. RUBBER LINING as an antidote to ever-present corrosion is discused in an 8-page bulletin by *Metalweld.*

44. CABLE CONTROLS for tractors, front and rear-mounted varieties, are described in a new *Caterpillar* booklet.

45. MULTIWALL BAGS, their types and uses, are shown in an interesting *International Paper* brochure.

46. THE LITTLE GIANT crane-shovel-trenchoe, truck, rail or crawler-mounted in two basic models for a wide range of service in pits and quarries, is described in this new 16-page catalog.

47. TROUBLE SHOOTING? A new manual "Proper Maintenance of Control" by *Allis-Chalmers,* filled with helpful hints and information, should help you overcome difficulties common to electric control devices.

48. QUICK-CONNECT COUPLERS for air, water, steam and chemical lines up to 8-in. size, said to indicate up to 80% flow and to have smaller dimensions and less weight, are described in this new *Snap-Tite* catalog.

49. 24-HOUR PUMPING of coarse and abrasive sands, flotations concentrates or other frothy pulps and like material up to ¼-in. solids is described in detail in this bulletin on the *Denver* vertical, centrifugal pump.

50. QUICK ROPE ATTACHMENT with *Sauerman* wire rope sockets and clamps is shown in this folder.

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State Geological Surveys Aid Mineral Producers

A wealth of valuable assistance can be gained through state geological surveys, as indicated by the work of the Indiana Geological Survey.

IN THE discovery and development of this nation's vast mineral resources, the state geological surveys have come to play an invaluable role. Furthermore, with the steady depletion of our mineral wealth and the constant search for new deposits,

By KENNETH A. GUTSCHICK

the role of state surveys is becoming ever-increasingly important. Unfortunately, however, this role is not fully understood by the general public, nor for that fact by the nonmetallic minerals producers, a group which *should* be vitally concerned with the activities of the surveys. It is the writer's purpose, therefore, to describe the functions and activities of these state surveys, as exemplified by the Indiana Geological Survey. This particular survey was chosen because it is one of the outstanding state surveys in the United States, particularly for its work in the industrial minerals field.

It is hoped that this article will evoke considerable interest, especially among nonmetallic mineral producers, since this particular group can probably benefit as much from the activities and findings of the geological survey as any other group. It is further hoped that the producers will make greater use of the surveys, perhaps even lending support and aid to their activities.

Before describing the workings of the Indiana Survey, however, it will be appropriate to present a general picture of state geological surveys in the United States. According to a report dealing with the income and activities of the state surveys in 1952, which was prepared by the Association of American State Geologists, every state in the union, except Massachusetts, Colorado, and South Carolina, has an active geological survey. The report also indicates that on the basis of state funds appropriated in 1952, the leading surveys include (listed in order of amount of appropriation) Illinois, California, Michigan, Indiana, Tennessee,, Missouri, Kansas, New Mexico, Florida, and Virginia. Each of these large surveys had appropriations exceeding $150,000, with Illinois ranking highest ($829,000) and California next ($390,000). A further breakdown showed that 9 states had available funds amounting to $100,000 to $150,000 each; ten states, $50,000 to $100,000; 13 states, $10,000 to $50,000; and 3 states, less than $10,000.

Judging from this wide range in available funds it is obvious that activities of the surveys vary considerably. The larger surveys, on the one hand, are complex organizations, staffed with a diversity of specialists, including not only geologists, but also physicists, chemists, spectrographers, engineers, laboratory technicians, and other technically-trained individuals. These staffs are generally increased during the summer months by the addition of college geology professors and advanced geology students. These surveys also maintain well-equipped, modern laboratories, which are needed for carrying on both routine and research activities. Smaller surveys, on the other hand, may be one- or two-man organizations, using university facilities to carry out research programs. Regardless, however, of the size and hence the scope of these surveys, each makes valuable contributions in the mineral industries field, as well as in other spheres.

State Geologist Charles F. Deiss, who directs the activities of the Indiana Geological Survey, Bloomington, Ind.

The main value of a geological survey lies in its principal objectives, namely, to obtain and distribute information relating to the mineral resources and geology of the state and to promote the wisest use of those resources. The surveys undertake coordinated research programs, which are based on detailed investigations, both in the field and in the laboratory. Through the media of publications, letters, personal conferences, and professional meetings, the wealth of geological information secured is made available not only to the general public but also to mineral producers, manufacturers using mineral raw materials, and other groups. The surveys thus work for the wisest development and utilization of mineral, industrial, and water resources, for public improvement, and for other worth while projects.

INDIANA GEOLOGICAL SURVEY

The Indiana Geological Survey, one of the country's earliest state geological surveys, was originally established nearly 100 years ago, and for several long periods after its founding, it was one of the leading state surveys in the United States. However, it did not become prominent in the industrial minerals field until recent years. Under the very competent leadership of Dr. Charles F. Deiss, who became state geologist in 1945, the Survey was reorganized in that year, and since then it has grown tremendously.

Located on the campus of Indiana University at Bloomington, the Survey is housed in several university buildings, including the main geology

building, and several recently-built quonset huts.

To carry on its diverse applied and theoretical research projects, a variety of specially trained persons is required. The permanent, full-time staff consists of 40 persons, including 16 geologists, a chemist, a clay mineralogist, three geophysicists, a paleobotanist and two spectrographers, plus technicians and the secretarial staff. The field and laboratory workers are supported by a reference librarian, an editor, four draftsmen, a photographer, an instrument maker, and a preparator. Additional field party personnel is employed in the summer, and temporary employees are used for miscellaneous laboratory tasks throughout the year.

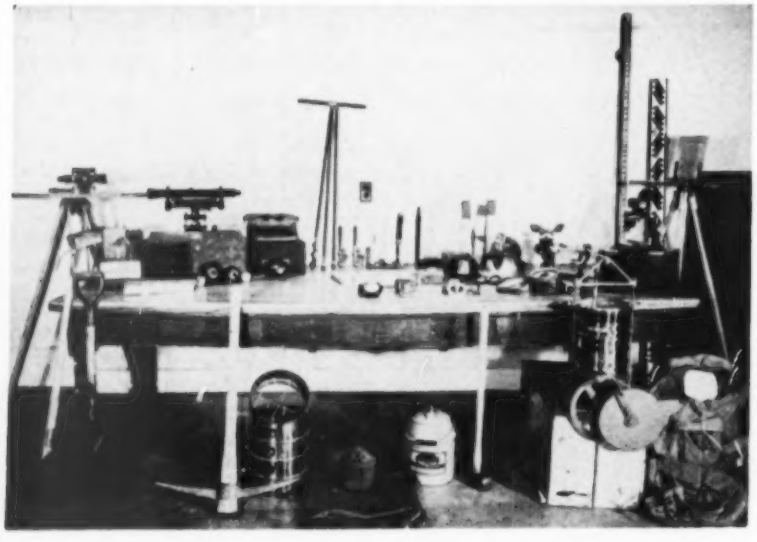
The Indiana Survey is divided into seven administrative sections—three dealing with mineral commodities, (coal, industrial minerals, and petroleum); three with special geological research (geophysics, geochemistry, and glacial geology); and one with the publication of maps, bulletins, and circulars. The last mentioned unit includes photography, drafting, editing, and sales.

The Industrial Minerals Section, with which the remainder of this article will be largely concerned, operates laboratories for routine analysis and fundamental research in spectrography, geochemistry, petrography, thermal analysis, and X-ray diffraction. A laboratory for coal petrology and spore analysis is operated by the Coal Section.

Because in some cases a geological problem studied by the survey will be within the province of more than one section, close co-operation is maintained between the various administrative units. For example, the special geological research sections were instrumental in recent studies made by the Industrial Minerals Section on the state's sand-and-gravel, crushed limestone, and silica sand resources. The strong position maintained by the Survey is based largely on the close intersectional co-operation that prevails. To foster this co-operative spirit, staff meetings of section heads are held bimonthly. Every effort is made to encourage personal friendly co-operation among the staff members.

Out in the field, John B. Patton, geologist in charge of the Industrial Minerals Section, examining a chip sample from a rock outcrop.

Variety of field equipment used by field parties of the Industrial Minerals Section.



Objectives of a Survey The basic objectives of the Indiana Survey, as outlined by Dr. Deiss, are as follows:

(1) To locate and describe accurately the state's mineral resources.

(2) To determine their mineralogic and chemical composition, their physical structure and properties, and their potential industrial uses.

(3) To provide other state agencies with all the geological and geophysical information that they require, and equally important, to teach their engineers the value of geology in solving some of their problems.

(4) To act as the impartial authoritative state agency to answer geologic questions for land owners and other private citizens.

(5) To do basic scientific research on all phases of the state's geology and mineral resources.

(6) To preserve and make readily accessible all oil-well samples, cores, electric, and other logs; all mineral analyses and specimens of minerals, rocks, and fossils, and

(7) To disseminate geologic information and conclusions to all interested schools, state agencies, industries, and private citizens.

To accomplish these objectives, the Survey has established two sound policies. First, it has set up its diversified program in order to furnish prompt geologic information to the mineral industries, to such state agencies as highway, conservation, and water resources, as well as to the general public. Second, the Survey officials hold annual conferences with various mineral producers and state agencies with the purpose of (1) finding out what types of geological research will be most useful to these groups, and (2) receiving suggestions of new or different approaches to various geologic problems. Thus the Survey's work is patterned to meet the needs of the mineral producer, the user of mineral raw materials, and to aid in the solving of engineering problems concerned with the construction of roads, dams, bridges, and other structures.

How It Works for Producers Before proceeding to a detailed discussion of the Industrial Minerals Section, the writer

would like to point out first a number of specific examples of assistance given by the Survey to mineral producers in recent years. First of all, several of Indiana's crushed stone producers and sand-and-gravel producers were assisted in the location of new quarry or pit sites. In these cases, the Survey provided information as to the areal distribution of the deposit, the character and probable thickness of the deposit, and the character and probable thickness of the overburden. Other sand-and-gravel producers were advised as to the most favorable direction in which to extend their pits. On the basis of recent survey investigations, two large limestone quarries were rezoned in order to permit the operator to produce acceptable stone from each zone (for example—agstone from one ledge, aggregate material from another ledge, etc.). Prior to the rezoning, the entire quarry face or ledging system used produced unacceptable material or else material acceptable for only one purpose.

The Survey has also furnished state highway engineers with geologic control of official quarry samples. In this case, the age and name of the formation or zone from which a particular sample was collected was determined. Then, whenever, the same formation was encountered at another quarry site, the data already available on that particular rock unit could be used (within limits, of course). In applying this method, the Survey proved by means of stratigraphic principles that the zones in the new quarry were (or, in some cases, were not) exact equivalents (in terms of age) of zones which had previously been tested.

The Indiana Survey has also cooperated with Indiana's Flood Control and Water Resources Commission concerning the permeability of certain limestone formations at potential dam sites. Then, too, the Survey has worked with stone and glass manufacturers who were trying to find new sources of limestone and limestone products. In addition, special problems of industrial manufacturers have been studied by the Survey, for example, to determine the source of impurities in a limestone product.

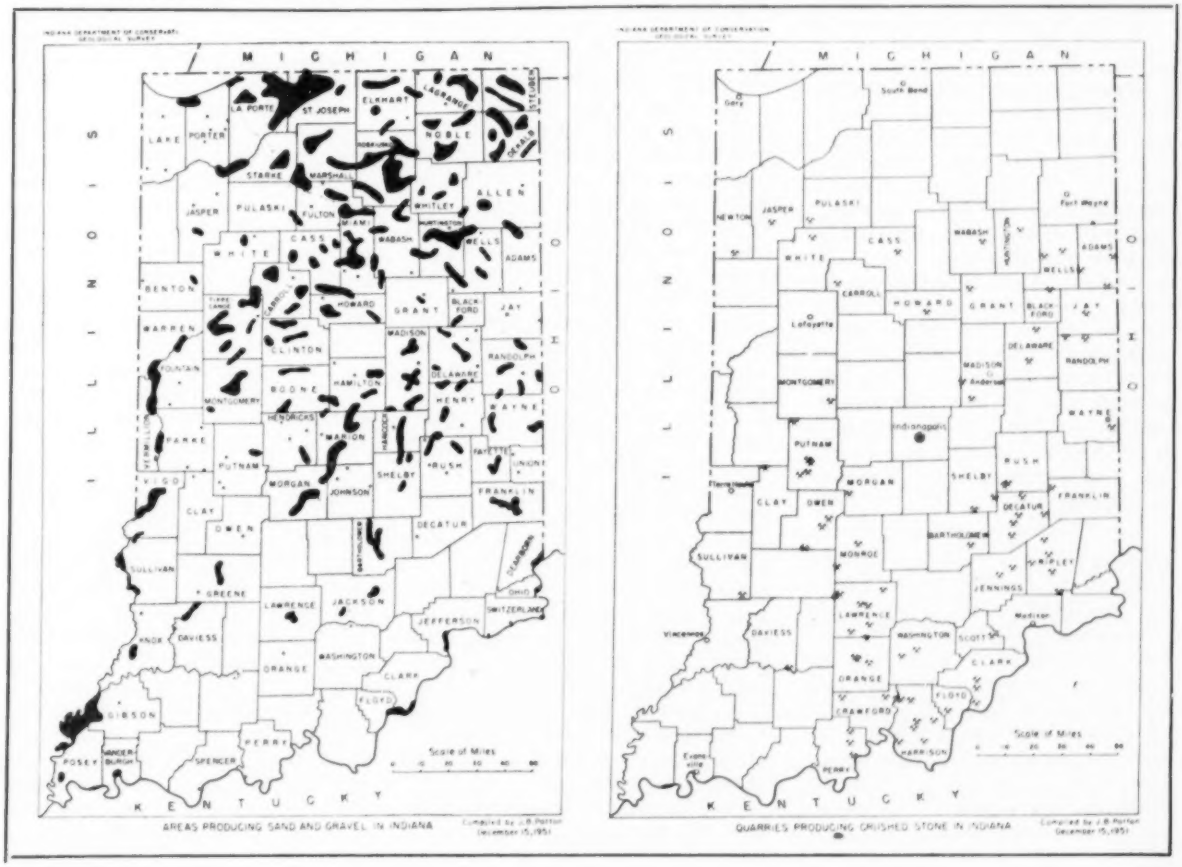
The Survey has also been consulted on zoning problems involving sand and gravel operations. In one particular case the Survey determined the distribution of available sand and gravel deposits in a municipal area. This information was used to determine whether a particular area should be zoned for mining or residential use.

On the basis of recent studies of the clay and shale deposits of the state, the Survey is prepared to furnish information on deposits suitable for such special uses as the manufacturing of lightweight aggregates. Producers are given such valuable data as probable thickness and extent of deposit, thickness of overburden, and other information.

INDUSTRIAL MINERALS SECTION

Because the Industrial Minerals Section is most intimately concerned with the pit-and-quarry field, this section will be described in detail. The section is headed by John B. Patton, who is also principal geologist of the Survey. Also included on the staff are Haydn H. Murray, clay mineralogist; Ned M. Smith and

Maps of state's quarrying and sand and gravel operations shown here, which were compiled in 1951, are examples of projects undertaken by the State Survey. A later sand and gravel map is now available. (see list at end of article.)


M I C H I G A N
I L L I N O I S
O H I O
K E N T U C K Y
AREAS PRODUCING SAND AND GRAVEL IN INDIANA
QUARRIES PRODUCING CRUSHED STONE IN INDIANA

A main tool for laboratory research at the Indiana Survey is the spectrograph, which is used to determine the chemical and mineralogical composition of limestone, sandstone, clays and other rock-types. R. K. Leininger, head of the Geochemistry Section is shown operating the spectrograph.

Samples of analyzed limestone and other rocks are stored in the spectrographic laboratory.

John Smith, geologists; and Ross Hickam, preparator. The Geochemistry Section is headed by R. K. Leininger, spectrographer, who is assisted by Ross Taylor, spectrographer, and M. E. Coller, chemist. This section works in close co-operation with the above mentioned group. In addition, the section is rounded out by several other staff members.

These two sections, housed in a separate building, constitute one of the best equipped laboratories among geological surveys. Major equipment includes a spectrograph, used to make analyses of rock and mineral samples, particularly of trace elements in the samples; a General Electric X-ray diffraction machine used to identify minerals, particularly clays, by analyzing their crystal and molecular structure; differential thermal analysis units used particularly in clay research; petrographic microscopes used to identify rock and minerals; various crushing and grinding units for preparing pulverized samples; cutting and polishing apparatus for making thin sections; and other important laboratory equipment.

Since the reorganization of the Indiana Survey in 1945 its Industrial Minerals Section has made extensive geological studies of the state's crushed stone, dimension stone, sand and gravel, industrial sand, and clay and shale resources. Much field and laboratory work has been completed or is near completion, and maps and bulletins describing the findings have been published or are about to be published. For a complete list of recent publications on industrial minerals now available, the reader is referred to the list at the end of the article.

Limestone A comprehensive survey of Indiana's limestone resources was begun during the summer of 1947 and 1948 by two Survey field parties. Approximately 90 active quarries producing crushed limestone were examined, sampled and mapped. Chip samples were carefully taken in order to provide nearly continuous samples from the bottom to the top of each rock unit represented in quarry exposures. These samples were later analyzed chemically and spectrographically in the Survey's laboratory.

Following the detailed study of each quarry site, the field party leader made a written memorandum report, on which was included the following: a sketch map of the quarry area; the exact location, ownership, and extent of property; a geological description of the quarry, which consisted of a measured stratigraphic section showing the distinct rock units and formations from which chip samples were taken; a detailed description of the formation and smaller rock units recognized; a detailed description of the type and thickness of overburden; a generalized account of the quarrying and milling operation; production data; and an estimation of the inferred reserves in the deposit.

Besides studying these active quarries, the field parties have visited many inactive quarries and a great number of limestone outcrop areas. Brief written reports of these limestone localities were also made, and these reports are placed in open file along with the much more detailed memoranda reports.

In determining the precise chemical and mineralogical composition of the chip samples, the survey scientists used chemical methods, the spectrograph, and the petrographic microscope, and will continue the study with thermal apparatus and an X-ray unit. The chemical method was used primarily to determine the percentage of phosphorous, sulphur, and carbon dioxide present in each limestone sample. The major constituents calcium, magnesium, silicon, aluminum, and iron, and the trace elements, were determined through the use of the spectrograph. Because the spectrograph lends itself to rapid and accurate analysis work, it has proved to be an invaluable tool in the Survey's outstanding limestone program. It was first used to determine the major constituents present in the samples and is now also being used to determine trace elements.

It is expected that this spectrographic study of trace elements may have numerous practical applications in the mineral industry field. For example, in the future agricultural limestone may be sold not only on the basis of the calcium-carbonate-equivalent, but also with regard to kinds and quantities of trace elements. The spectrographic study may also be used as another method in the correlation of sedimentary deposits. Finally, this study is also basic in the field of geochemistry, and it should throw light on the distribution and origin of trace elements in the earth's crust.

Upon the completion of the limestone analyses, the Survey placed the test data on file, thus supplementing the memoranda reports mentioned earlier. Thus, chemical analyses are available for all the active quarries in the state, as well as for most other limestone localities. This chemical data is crossfiled on the basis of

geographic location, formation name, and sample number.

Following the completion of the basic field work and initial chemical analyses, a preliminary report, *Crushed Stone in Indiana,* by John B. Patton, was published in 1949 (see end of article for reference). Besides describing the various limestone formations in the state, this important 47-page publication also lists and briefly describes 89 active quarries in the state. It also contains tables which give the chemical analyses of the various limestone formations quarried in Indiana. The analyses are given in terms of $CaCO_3$, $MgCO_3$, Al_2O_3, Fe_2O_3, SiO_2, TiO_2, and CO_2 content. Finally, the report includes a valuable map showing the distribution of quarries in the state, as well as the geologic formations present at each quarry.

This preliminary report is soon to be followed by bulletins covering the complete limestone survey of the state. Based upon the detailed analyses, the comprehensive reports will point out the characteristics and regional variations of the various limestone and dolomite formations in the state. In addition the study will point out certain limestone deposits which are not being presently exploited, but which have commercial possibilities.

Another worthy project involving limestone deposits on which the Industrial Minerals Section is working is the detailed aerial geologic mapping of the middle and upper Mississippian rock strata, which outcrop in a wide, roughly north-south trending band in the south-central part of the state. In earlier geologic mapping, the Mississippian beds were differentiated into two parts, using the top of the Salem limestone as the boundary. The new map, which is near completion, will show the upper boundary of the Ste. Genevieve limestone, as well as the boundaries between the lower, middle, and upper Chester groups of rocks.

Detailed mapping of this group of rock strata is valuable, since many of Indiana's quarries obtain high-quality limestone from the Mississippian. One practical application will be to help producers locate new quarry sites. In particular, the location of the Ste. Genevieve-Lower Chester contact will be important to know, since the Ste. Genevieve is largely a high-quality limestone, whereas the lower Chester is predominantly an alternation of thin limestone and sandstone beds, much of which is unsuitable for quarrying.

Haydn H. Murray, clay mineralogist, using X-ray diffraction machine to identify minerals.

Sand and Gravel The Industrial Minerals Section has also completed an outstanding survey of the state's sand and gravel deposits. Field work, begun in the summer of 1949 and completed during subsequent field seasons, revealed more than 3,000 sand and gravel pits in the state, 612 of which were active or active-on-demand. Information on each pit, including location, type and thickness of both the deposit and overburden, geologic origin of the deposit, other geologic features, and (if pit active) the type and scale of operation, production and other factual data, were obtained. Thus, information similar to that obtained in the limestone survey was gathered and the material was placed on permanent specially printed file cards.

Following the initial field survey, detailed laboratory studies were made of samples collected from 92 pit locations scattered throughout the state. The sampled pits were primarily located along glacial sluiceways (meltwater channels) extending considerable distances beyond the ice front (for example, the Wabash Valley) and also in broad outwash plains formed at the ice front.

The laboratory work included both sieve analysis and lithologic (rock-type) analysis. For the size analysis, samples were conveniently separated into five size gradations, using the 2-in., 1-in., ½-in., and No. 4 sieves for this purpose.

With the aid of the binocular microscope, lithologic studies were made of all size fractions except the minus 4-mesh, in order to determine the relative amounts of some 20 rock-types present in each deposit. Determinations were made of such igneous rock-types as granite, basalt, felsite, diorite, gabbro, and others; of such metamorphic rock-types as quartzite, schist, and gneiss; and of such sedimentary rock-types as limestone, dolomitic limestone, dolomite, sandstone, shale, siltstone, and chert. In addition, such minor constituents in gravel deposits as coal, mud balls, and limonite were noted and recorded.

One outstanding value of the lithologic study was the determination of the relative amounts of deleterious materials like chert, ocher, clay balls, coal, shale, soft sandstone and siltstone, weathered schist, etc., present in the deposits. On the basis of this lithologic study some important generalizations can be made as to the geographic distribution of various deleterious materials in the state.

Among the major findings of the elaborate sand and gravel study were the following: in the sluiceways, the particle size decreases (the sand-to-gravel ratio increases) steadily in the downstream direction, while the amount of hard, resistant materials like chert become relatively more abundant downstream; the lithologic character of the deposit reflects to a large degree the changes in bedrock over which the ice passed immediately before depositing its load.

Presently both field and laboratory work in the sand and gravel program has been nearly completed, and it is expected that a comprehensive report of the study will be published during the coming year. Among the many invaluable features in the report will be a map showing the distribution of the state's sand and gravel deposits and the active producing localities. This data will be superimposed on an up-to-date glacial map of the state.

Industrial Sands In the field of industrial sands, the Indiana Survey has recently published one bulletin on the *Industrial Sands of the Indiana Dunes* (1952) and is currently working on an exhaustive study of the potential silica-sand resources of the state. Field work on this latter project was started in 1951 and has now been completed; and the final report is expected to be published by the early part of 1954.

The Indiana Dunes report deals with the extensive fine-grained sand deposits that occur in northwestern Indiana adjacent to the Lake Michigan shoreline; these deposits are presently being used for fill, molding sand, asphalt paving, plaster and mortar sand, core sand, engine sand, and other purposes. The bulletin includes an important map which shows the extent and approximate thickness of the sand deposits, the location of present mining operations, and the distribution of various

glacial features. The report not only describes the origin of the deposits, but also summarizes laboratory analyses made of the sands, including their grain size, chemical analysis, composition and roundness, and density separation. Current production practices are also briefly described.

The Survey's recent investigations of the high silica-sand deposits of Indiana represent an excellent example of how consumers' specifications somewhat govern the projects undertaken by the Survey. In this case, glass manufacturers requested information as to potential sources of high-silica sand in Indiana. Before the project was undertaken, the geologists were told exactly the specifications that any newly discovered sandstone deposit must meet.

Because the sand and sandstone deposits of Indiana are of different geologic age and formed under different environmental conditions, the initial field investigations were conducted by six separate field parties, with each party examining one specific age group of strata outcropping in a certain section of the state. Each field party was headed by a specialist on that particular group of strata, thus facilitating the field work considerably.

To elaborate on the use of specialists in this study, one party, which examined sandstones found in the middle and upper Pennsylvanian (coal-bearing) strata, was under the direction of the head of the Coal Geology Section. Another party, studying Mississippian sandstones, was headed by a stratigrapher who had recently done considerable work on rocks of that age in Indiana. A physiographer was placed in charge of the party studying the sandy Ohio River formation (Tertiary age), because the deposits are largely covered and best studied as topographic features.

The field parties collected a total of 192 samples, which were later analyzed chemically and spectrographically and also according to grain size. The spectrograph was especially helpful in determining possible impurities in the sandstone formations. Laboratory investigation was also made to determine the possibility of beneficiating certain silica sand samples, thus making the sand meet specifications.

A progress report on the silica sand study has already been published (February, 1953). As in the case of the limestone and sand and gravel surveys, laboratory data on the silica sand samples has been placed on open file, and is thus available to

Data for determining the depth of bedrock in Indiana are obtained through the use of a refraction seismograph. Shown here is the recording part of the seismograph, mounted in the rear of a Survey panel truck.

study by the glass manufacturers, as well as other interested concerns.

Clay and Shale The Indiana Survey is also carrying out an extensive long-term research program on the state's clay and shale deposits. Each operating clay pit has already been studied and sampled; and presently the samples are undergoing careful laboratory analysis and testing. In addition the survey is studying and testing Mississipian and Pennsylvanian shale deposits for their potential use as raw material in the manufacturing of lightweight aggregates.

Further details of the Survey's clay program will not be discussed, as the clay industry is not part of the PIT AND QUARRY field.

GEOPHYSICS SECTION

As mentioned earlier, the Indiana Survey also operates a Geophysics Section, headed by M. E. Biggs, geologist. Because one the projects undertaken by this section is related to the industrial minerals field, brief mention will be made of this section.

One vital project of the section is the determination of the depth of bedrock (or what amounts to the same thing, thickness of over-burden) in the state. This data is being gathered through the use of a refraction seismograph and also with electrical resistivity apparatus. (These two types of equipment are used by oil companies in subsurface exploration work). This apparatus is also being used by the survey to determine the type of overburden and the character and type of bedrock surface. In addition, it has possible application in the location of buried river channels containing deposits of sand and gravel, which may represent possible sources of water supply.

It is expected that the map of Indiana showing the thickness of overburden will be published by this fall. This map will be an invaluable tool in the location of new quarry sites and sand and gravel pits.

COAL AND PETROLEUM SECTIONS

The Indiana Survey has also made valuable contributions in the study of Indiana's coal and oil and gas resources. However, because these fields are outside the scope of the PIT AND QUARRY field, they will not be discussed. These two sections are mentioned merely to indicate the wide range of activities undertaken by the Indiana Survey. Thus, the Survey is geared to meet the geologic needs of all the mineral industries in the state.

Summary and Conclusions It is hoped that this glimpse into the organization and activities of the Indiana Geological Survey will make the reader fully realize the immense value of a state geological survey in the development of the nation's mineral deposits. The Indiana Survey, in particular, has made and will continue to make outstanding contributions in mineral resources development, nearly all of which are of direct or indirect interest to nonmetallic minerals producers.

By providing assistance in the location of new quarry or pit sites, the extension of old pits, and the rezoning of quarries; by providing geological control of state highway department quarry samples; and by helping to locate new sources of high-quality limestone, high-purity silica sand, shale suitable for lightweight aggregate, and other types of deposits, the Indiana Survey has performed invaluable services to the industry. In addition, the Survey has gathered a tremendous wealth of data (geology, chemical analysis, gradation analysis, etc.) on the state's limestone quarries, sand and gravel operations, clay pits, and other mining operations and deposits—data which are placed on open file and thus of great potential value to producers.

In conclusion, the writer would like to emphasize that although the Indiana Survey's activities have innumerable practical applications, it also undertakes the study of basic geological research problems, which advance the field of geology. The Survey does not operate a commercial testing laboratory or consulting service. When a sufficient answer to a problem can be furnished by a consulting geologist, a drilling company, or a laboratory, the Survey recommends that the producer consult with the appropriate concern.

Recent Publications Below is a selected list of recent publications of the Indiana State Geological Survey which are of particular interest to nonmetallic minerals producers:

Report of Progress No. 3: *Crushed stone in Indiana,* Patton, John B. (1949), 47 pp.

Report of Progress No. 5: *Preliminary report on high-silica sand in Indiana,* Murray, Haydn H., and Patton, John B. (1953), 35 pp.

Directory Series No. 1: *Directory of producers of mineral raw materials, exclusive of oil and gas, in Indiana.* Callaghan, Eugene, and Ecker, Jean (1948), 88 pp.

Bulletin No. 1: *Endellite deposits in Gardner Mine Ridge, Lawrence County, Indiana,* Callaghan, Eugene (1948), 47 pp.

Bulletin No. 2: *Physiography of the lower Wabash Valley,* Fidlar, M. M. (1948), 112 pp.

Bulletin No. 4: *Glacial sluiceways and lacustrine plains of southern Indiana,* Thornbury, William D. (1950), 21 pp.

Bulletin No. 5: *Glacial geology of Wabash County,* Wayne, William J., and Thornbury, William D. (1951), 39 pp.

Bulletin No. 7: *Industrial sands of the Indiana dunes,* Bieber, C. L., and Smith, Ned M. (1952), 31 pp.

Circular No. 1: *Geologic formations on which and with which Indiana's roads are built,* Deiss, Charles F. (1952), 17 pp.

Industrial Minerals Atlas Map No. 1: *Map showing location of clay and shale pits and ceramic plants in Indiana,* Murray, Haydn H. (June, 1952).

Industrial Minerals Atlas Map No. 2: *Map showing location of sand gravel pits in Indiana,* Patton, J. B., and Smith, Ned M. (June, 1952).

Miscellaneous Map No. 2: *Map of Tippecanoe County, Indiana, showing thickness of glacial drift,* Wayne, William J. (1953).

Industrial Sand Meeting

(*From page* 202.)

of the association's abrasives committee, which was formed in October.

The speaker concluded by discussing the seriousness of the dust problem, particularly for plants producing silica flour.

Following Mr. Walker's report, the special committee on abrasives held an unscheduled afternoon session and considered the slag grit problem.

Labor Relations During the last session a round-table discussion was held on the subject of employer-employee relations in the industry. Norman H. Crissey (Wedron Silica Company, Chicago) discussed the recent negotiations between silica sand producers and workers in the Ottawa, Ill., district. He reported that a one-year stipulation agreement was signed in March, 1953, granting (1) a 12½c per hour raise and (2) an increase of from 4c and 6c to 5c and 10c shift differentials for the second and third shifts.

Other producers also discussed labor negotiations in their particular area. As a result of the interesting discussion which took place, the association formed a new advisory committee on labor, headed by Ralph S. Lebold and including William D. Chadwick, Robert R. Coxey, Arthur B. Schlesinger, F. C. Wachter, and A. Warsaw.

The meeting was concluded with the very informative talk by Vincent P. Ahearn, executive secretary of the association, on the Washington scene. Mr. Ahearn discussed President Eisenhower's first few months in office, pointing out the large number of problems facing the new administration. After commenting on the cabinet members as well as several leading Congressmen, the speaker touched on problems involving foreign affairs, atomic energy, government budget, and other serious matters.

Election of Officers The three executive officers, C. M. Hardy (Hardy Sand Company, Evansville, Ind.), Clarence R. Wolf (New Jersey Silica Sand Company, Milleville, N. J.), and Emery M. Durstine (The Keener Sand and Clay Company, Columbus, Ohio), were re-elected to serve another year as president, vice-president, and treasurer, respectively. Newly-elected board members for a one-year term were Nanko Bos (John N. Bos Sand Company, Chicago, Ill.), and Harte Campbell (Sun Sand Company, Thayer, W. Va.). Re-elected to the board for another year were William J. Cannon (The Nugent Sand Company, Muskegon, Mich.), G. M. Mason (Clayton Silica Company, Cedar Rapids, Ia.), Marcus S. Wright Jr. (South River Sand Company, Old Bridge, N. J.), and P. G. Forman (Industrial Silica Corporation, Youngstown, Ohio). A. Y. Gregory, George A. Thornton, and Sterling N. Farmer continue as *ex officio* members of the board.

Future Meetings Announcement was made that the semi-annual meeting will be held at the Greenbrier, White Sulphur Springs, W. Va., on October 21, 22, and 23. Next year's annual meeting, originally scheduled for May 12 to 14 at the Homestead, will have to be rescheduled by the board of directors, since the American Foundry Society will hold its annual meeting during the same week. N.I.S.A.'s annual meeting will probably be held in Florida about the middle of April, 1954.

Crystal Silica

(*From page* 187.)

ucts is obtained by carefully controlled production techniques.

Open-pit sand from 80 working acres (80 additional acres now on lease) located in the upper reaches of Loma Alta canyon on the Escondido branch of the Santa Fe railroad is conveyed to a standard washing operation and then to a dryer. From the dryer the sand moves to the screening room. To obtain the required five sizes, ranging from minus 10 to minus 60-mesh, Crystal Silica uses the revolutionary new principle of the Sweco vibrating screen separator, made by the Southwestern Engineering Company.

Using a scalper and nine Sweco separator units (each 48 in. in diameter), Crystal Silica has obtained a 50 percent increase in screening ability since installing them in 1952. All screening is done on stainless steel cloth except for the scalper, which uses carbon steel cloth. Screen life averages four to six months (or 200 days on a 24-hour, 7-day-week production schedule).

In order to maintain uniformity and effective size of all materials, it is necessary to screen the minus 30 and minus 60 sand out of the aggregate before taking intermediate sizes. Between minus 10 and minus 60 the company enjoys 98 percent efficiency, whereas the commercial standard has usually been accepted as 85 percent efficiency. The officials regard this high rate of efficiency as a "must" if they are going to continue to supply satisfactory silica sand to buyers of all grades.

Crystal Silica is thoroughly satisfied with the new fine-screen modernization program. "We will continue to refine our sand to meet as many buyer specifications as we can," Mr. Harper declared, adding that "modernization is the best answer to the problem of increasing business." The company plans to buy several additional Sweco separators in the near future to augment production.

New Welding Procedure Improves Maintenance Of Pulverizer Parts

another P-Q exclusive

A SYSTEMATIC program of welding maintenance is cutting repair costs and minimizing down-time for Dragon Cement Company, Inc., Northampton, Pa. Pulverizer die rings, plows, rolls, and other wearing parts are replaced on a regular basis with a set of spares which has been put in better-than-new shape by the efficient maintenance shop headed by Arthur Schaffer, master mechanic. The three pulverizers for grinding of clinker require a continuous welding program on pulverizer parts alone to keep up with wear and batter.

Longer life for reclaimed parts is being obtained since the shop has started to use the "Faceweld 12" electrode with a bead overlap procedure, according to Mr. Schaffer. For example, they are getting about 2,600 hours of service from pulverizer die rings hard surfaced with this Lincoln electrode—about 30 percent more life than formerly. They also apply this chromium carbide-type electrode to new steel die rings .35 to .40 carbon, here requiring about 100 pounds of the electrode for the 6-ft. diameter rings.

Worn die rings are usually full of gouged-out holes, some as large as 6-in. across and 2-in. deep. See Figure 1. These must be filled with weld metal before the surface generally is built up to proper depth and hard surfaced.

The shop has built a fixture for welding these die rings. It consists of two rollers mounted on a steel base, as shown in Figure 2. The chain of the hoist used to lift the ring is loosened; it serves as a guide at the top to keep the ring from falling.

Figure 1—Closeup of gouged-out hole in worn die ring. Rule shows size.

Holes in the die ring are first built up and all irregularities of the ring's worn inner surface are restored with a ¼-in. E-6012 type electrode. After completion of the build-up with this mild steel electrode, the entire inner surface is covered with hard facing electrode metal. By weaving, beads of about 1-in. width are produced, running across the width of the ring. Each bead is overlapped, over half the previous one, producing a net thickness of deposit equal to about two normal beads.

Figure 2—Setup for welding die rings.

Some die rings with heavy wear require a total of as much as 200 lb. of build-up and hard face weld metal. A close-up view of two completed rings is shown in Figure 3.

Another part, the pulverizer roll, which is reclaimed by the same method, is shown in Figure 4. On the right is a worn roll; on the left is one after build-up and hard facing. Here, too, electrodes of the same type were used for build-up and for hard surfacing, with the beads running cross-wise and overlapping each other as in the case of the die rings. Other rolls are mounted on the arms which carry them around the inner periphery of the pulverizer die ring.

The pulverizer plow points shown in Figure 5 have been reclaimed by the same method. Often the entire point is broken off, requiring build-up with mild steel weld metal before hard facing the wearing surfaces. To simplify the welding of plow points, the shop clamps on a copper plate to serve as a dam and keep the weld metal square along the edge.

Since the plow points are castings, welding heat must be minimized. To do this and keep the work moving, the shop welds several points at a time. While one point is cooling, the welder works on another. Average welding time per point is about 1½ hours.

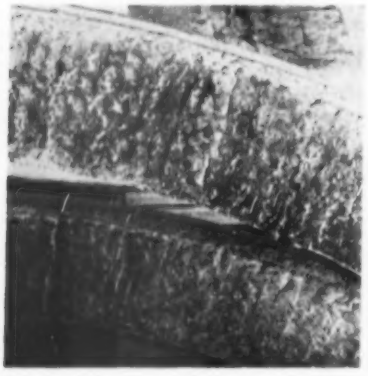


Figure 3—A closeup of hard surfaced die rings.

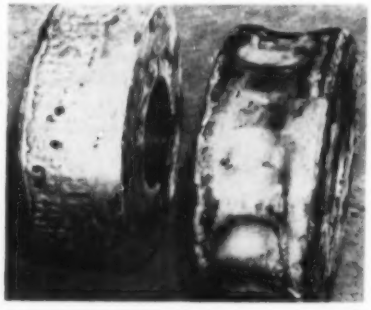


Figure 4—Pulverizer rolls, worn on the right and reclaimed on the left.

Figure 5—Two sides of pulverizer plow points which have been reclaimed.

ALTERNATE-VELOCITY LOADING INTRODUCED

Second major development in blasting technique appears to extend benefits gained with millisecond delay system.

By DAVID M. McFARLAND

Manager, Technical Division
Atlas Powder Company

A full year's experience with a new blasting refinement which extends and improves millisecond delay action appears to offer the quarry operator notable savings by producing rather spectacular increases in breakage, and better performance generally.

Used in conjunction with the millisecond delay method, the new alternate or differential-velocity loading technique also puts time to work, but seems to enhance the twisting and shattering action of the fast delays.

Quarry operators need not be graybeards to recall the early concept once held by the explosives industry that simultaneous firing of all holes along a quarry face produced the best results. When millisecond delay blasting was introduced in 1945 and subjected to photographic analysis, that early concept was disproved. It became apparent that far better results were obtained when the burden was placed under sustained stress by a first set of charges fired close together but not simultaneously and, while still stressed, followed a small fraction of a second later with the "knockout punch" of a second set with close but not simultaneous timing. It may well be restated here that improved breakage and control so obtained, along with the reduced vibration, noise, and need for secondary blasting, all depended basically on keeping the gases of the explosives under prolonged confinement. This condition, in turn, requires initiation of the blast at the point of maximum confinement — normally the bottom of the drill holes. In quarries where there is a free parting at floor level, the point of maximum confinement would normally be farther up the hole.

Fig. 1. The 130-ft. face of a Pennsylvania cement plant quarry just before the shot. Ten holes have been loaded with quarry explosive, and electric blasting caps No. 1 and No. 2, which will fire approximately 8 and 25 milliseconds, respectively, after initiation, are in place at the bottom of alternate holes.

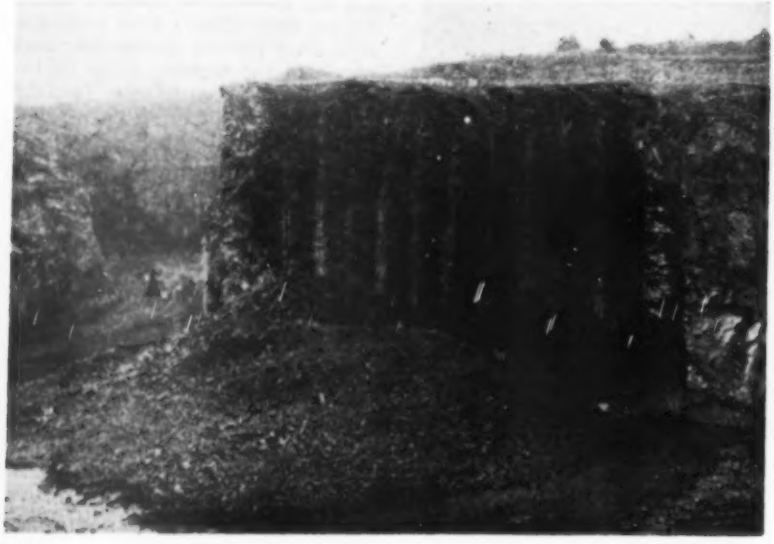
Alternate-velocity loading continues to employ millisecond delay, but it makes added use of the important time factor by introducing, in the same blast, relatively low- and high-velocity explosives. Simply stated, alternate holes are loaded with low-velocity and high-velocity charges. The faster millisecond delay caps fire the low-velocity holes to utilize the stressing action on the rock; the next delay releases the sharp second punch of the higher-velocity explosive. Results, even to those familiar with development of the system, tend to be surprisingly effective. Apparently, the slower explosive fired first tends to place tension or stress on the rock without excessive shattering or release of explosive gases; this increased stress or wedging action then seems to give the sharper second explosion a chance to penetrate farther into the burden with a resulting breaking and twisting action considerably greater than that produced by the unmodified millisecond delay system.

This supposition ceases to be purely theoretical when the new face

Fig. 2. One-third of a second after detonation the camera shows that the toe has already started to move forward, well in advance of the rock at the top of the face. No geysers of escaping gases have developed, and there is no trace of air blast.

Fig. 3. Two-thirds of a second after detonation the toe is still clearly leading the outward movement of the rock. Also, the alternate pattern is obviously working evenly through the burden.

Fig. 4. Close inspection of this photograph, made one full second after the blast, will show the burden completely broken at a time when it is only beginning its downward fall. The distinct outward movement takes the entire pile away from the face.



is observed after an alternate-velocity blast. Alternate holes (Fig. 5) fired with the low-velocity explosive appear larger and lighter colored. They show a broader spread of breakage across the face, as contrasted with the thinner marks left by the high-velocity material. It is significant that quarry blasts have been made with this technique which did away totally with any need for secondary blasting. In the opinion of veteran explosives men who have worked with alternate-velocity loading, the low-velocity charge explores lines of weakness in the burden; then the high-velocity explosive drives the gases into the stressed areas and finishes the job. Use of too high a velocity, at least in rock which is not brittle, appears to work too much on the face rather than on the burden, it has been found.

The original conception of differential- or alternate-velocity loading was outlined in the first millisecond delay theory, but until a year ago this action had received little more than experimental attention. As with any new development, the value of alternate-velocity loading must be measured with an eye to its economics: is the improvement in production outweighed by increase in cost? Happily, a low-cost way of achieving high-velocity effects already existed in the cored ammonium nitrate explosive covered by U. S. Patent 2,609,750, and is used in the new technique.

Continuous cores, 1¼ in. in diameter, extend throughout the cartridge, so that the velocity rate of the cartridge can be governed by the composition of the core. In this fashion a small amount of gelatin gives the entire cartridge the linear velocity behavior of the core. End result, clearly, is much less costly than varying the explosive ingredients of the whole cartridge. Typical quarry blasting may call for a 60 percent gelatin core for high-velocity, 30 for low-velocity explosive.

It should be noted, too, that accessory benefits result from the cored method of manufacture. Not only is the core material inherently water-resistant, but also the core, being imbedded in the cartridge, is in contact with the dynamite around its entire periphery. By contrast, the contact of a primer along the edge of the cartridge is hardly more than linear. The rate of pressure development

(*Continued on page* 220)

Fig. 5. This picture of the final pile shows the existence of a distinct "valley" between the crest of the muck pile and the face. The height of the pile guarantees safe and productive cuts with a shovel.

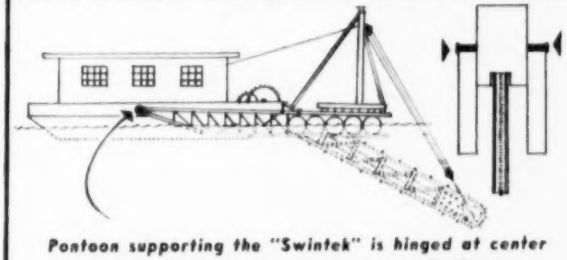
Reports WAPAK SAND & GRAVEL CO.

WAPAKONETA, OHIO

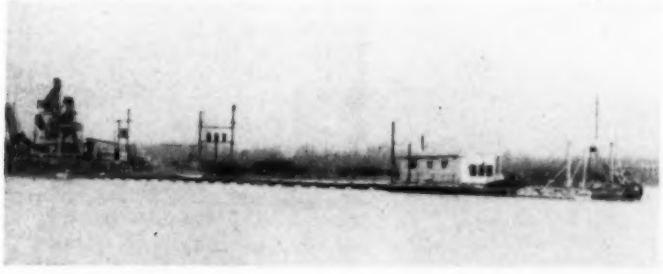
EAGLE Sand and Gravel equipment is much in evidence at the several plants of the Wapak Sand & Gravel Co., Wapakoneta, Ohio.

An Eagle "Swintek" Traveling Screen Chain Dredging Ladder recently installed at one of the Wapak plants is shown. It is a 40' Light Duty unit. Suction line is 8" up to the 6" pump. Production averages 70-tons per hour—half sand and half gravel.

Interesting feature—engineered by Eagle—is the pontoon system supporting the "Swintek". It is pivoted or hinged on the sides of the dredge at the center. Therefore, no matter in what position the "Swintek" may be, the load applied to the dredge is always applied at the center and there is no tipping action—dredge remains level.



Pontoon supporting the "Swintek" is hinged at center of dredge—dredge remains level at all times.



Wapak reports 100% improvement in operations since installing the "Swintek". Shutdowns from clogged lines eliminated—uniform flow of material to the plant on shore.

Send for literature on the "Swintek".

Wapak Uses EAGLE Fine Material Washers, too!

Wapak's plants have used Eagle Fine Material Screw Washer-Classifier-Dehydrators long and successfully. One is in operation at the plant above where "Swintek" is in use.

EAGLE IRON WORKS

LEADERS IN AGGREGATE WASHING AND CLASSIFYING EQUIPMENT FOR HALF A CENTURY

133 HOLCOMB AVE.
DES MOINES, IOWA

Ohio Gravel Producer Expands—Builds Second Plant at Same Deposit

another ON THE SPOT report

Usually when the demand for aggregates exceeds the output of a plant, its capacity is increased; but there are exceptions to this rule. Conditions sometimes make it advisable to build a second plant to get this capacity, sometimes operating from the same deposit. This was the case with the Sidney Sand & Gravel Company of Sidney, Ohio, a pioneer producer in that part of the state. This company had never attempted to cover more than a limited area around Sidney, but when the local demand exceeded the capacity of its existing 40-t.p.h. sand and gravel plant in 1951, a new 60-t.p.h. plant was built alongside the original facilities. The output is sold within a radius of 10 miles to townships, counties, cities, the state, and contractors. Operations are conducted practically all year, being shut down only 30 days during the dead of winter.

The original plant was built in 1922 by a highway contractor who had difficulty in getting suitable aggregates when he needed them for his jobs. In spite of the determination to remain a strictly local business the company expanded somewhat before and during World War II. Efforts were then made to get side-line businesses to locate on the property. In 1947 a ready-mixed concrete plant was built and leased to Arthur Franz, who now operates five Jaeger mixer trucks of 2½- to 5-cu. yd. capacity. Later a deal was made with G. A. Smalley to put in a 600-ton per day Cummer aggregate-bituminizing plant. This installation was one reason for expanding the aggregate-producing capacity. Output is now about 120,000 tons annually, ten times that of the original operation.

A general view of the Sidney Sand & Gravel Company's plant at Sidney, Ohio, showing the No. 2 sand drag, the ground level storage bins, and the stockpiling conveyor.

The deposit lies one mile east of the Sidney city limits on State Route 47. It is of glacial origin, 30 to 60 ft. deep, with about 10 ft. under water, and consists of Grade A gravel with a high percentage of fines. A slackline cableway excavator was originally used. When the pit expanded beyond the range of this equipment, draglines and trucks were installed. Two draglines are now being used—a Kochring ¾-cu. yd. and a Mead-Morrison ½-cu. yd., both using Pettibone-Mulliken buckets. Both are gasoline powered. For hauling to the plant and for deliveries the company owns seven dump trucks—six Internationals and a Ford.

At the new plant the sand and gravel is dumped from the trucks into a 15-cu. yd. concrete hopper with a Jeffrey vibrating feeder. This discharges to a Jeffrey-Ebersol combination scalper-crusher, consisting of a vibrating scalping deck, a 12- by 40-in. primary jaw crusher, and a 3- by 40-in. secondary jaw crusher. The screen deck scalps plus 1-in. material to the primary crusher, which is set at 2½-in. maximum opening. The secondary jaw is set at 1½-in. maximum. The minus 1½-in. product of the crusher and the scalper throughs drop into a pit.

A Jeffrey 50-ft. chain bucket elevator picks up this material and discharges it into a heavy iron chute with baffles, where water from the sand settling tank is introduced. In

In the pit the ¾-cu. yd. gas-powered dragline is loading to a truck. Draglines replaced the slackline cableway excavator originally used.

this way the material is saturated and broken up to loosen the fines from the gravel before it is discharged on the 4- by 10-ft. Deister Machine Company 3-deck vibrating screen, which is equipped with washing sprays. The decks are usually equipped with ¾-, ¼-, and ⅛-in. wire cloth, respectively. The oversize (plus ¾-in.) is chuted to a double-roll crusher, set at ⅞-in., and returned by the same bucket elevator to the screen for rewashing and regrading.

The sand (minus ⅛-in.), through the bottom deck of the screen, goes to the No. 1 sand drag, where about half (500 g.p.m.) of the water is taken out by a Gorman-Rupp centrifugal pump and fed to the soaking chute. The sand from this drag goes to a 40-ft. flume, where fresh water is added. A second sand drag dewaters the sand and discharges it to a stockpile.

The No. 9 gravel passing the ¼-in. screen deck and retained on the ⅛-in. is chuted to one of three ground-level bins of 200 tons' capacity each. These bins are separated by concrete walls built into the hillside below the plant. The No. 46 gravel through the ¾-in. deck and retained on the ¼-in. is chuted to an 18-in. by 110-ft. Neer's belt conveyor which discharges from a height of 50 ft. to a stockpile.

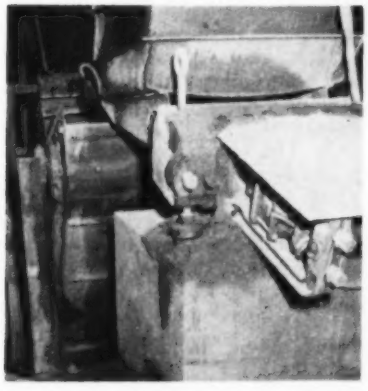
When desired, instead of No. 46, No. 4, No. 6 and No. 3 gravels can be made by using 1-, ½- and ⅛-in. decks on the screen. The oversize, No. 3 (plus 1-in.) is chuted to a pile alongside the bins. The No. 4 (½- to 1-in.) off the middle deck is chuted to one of the ground level bins. The No. 6 (⅛- to ½-in.) off the bottom deck usually goes to the third bin but it can also be stockpiled with the belt conveyor when desired.

At the older plant sand and gravel is dumped into a hopper with a Jeffrey vibrating feeder to a scalping screen. The oversize goes through a Lippman 15- by 24-in. jaw crusher and by belt conveyor to a 20-in. Symons cone crusher. A belt conveyor and a bucket elevator take the crushed material and that through the scalping screen to a series of two 3- by 6-ft. Deister Machine Co. vibrating screens—one 4-deck and the other 3-deck. These are followed by a 4- by 10-ft. one-deck screen of the same make.

The plant is located near the headwaters of the Greater Miami River and obtains wash water from it. A 3-in. Gorman-Rupp centrifugal pump feeds water up 50 ft. to the screen and sand drag in the new plant, which requires about 800 to 900 g.p.m. It has been explained that about half the water from the drag is re-used. The other half is flumed to a worked-out pit from which it filters through into a supply pit for the old plant. A 3-in. Gorman-Rupp pump supplies this plant.

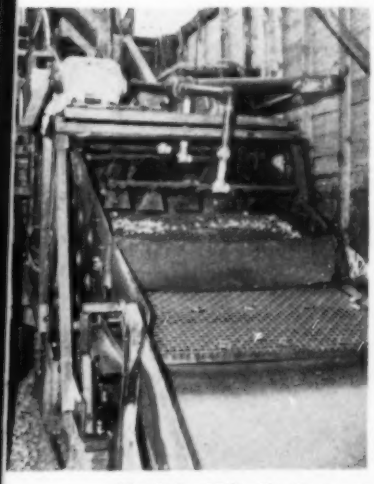
This comany operated under the sole ownership of William Milligan and under the name of Sidney Washed Sand & Gravel Co. until November 1, 1951. It was then incorporated under the present name with William Milligan as president, J. L. Hershey as vice-president and superintendent, and Samuel Milligan as secretary and treasurer. Samuel Milligan is the son of William Milligan.

The Davidson-Merritt Sand and Gravel Company of Indianola, Nebr., was awarded a contract for two jobs totaling $11,304.30 for maintenance graveling of state highways in southeastern Nebraska.

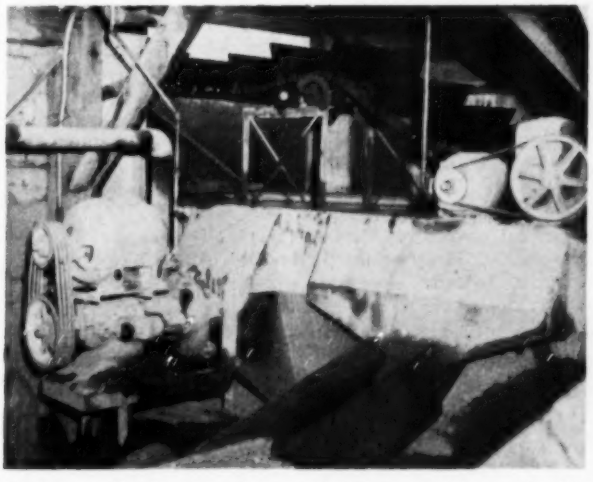


The vibrating feeder to the combination scalper-crusher (background).

Another view of the combination scalper-crusher, with the vibrating feeder above.



The 4- by 10-ft. vibrating screen which does all the fine sizing in the plant.



The No. 1 sand drag with the pump (left) which recirculates about half of the overflow.

The 4-in. centrifugal pump which supplies wash water from the storage pond.

Report on Current Labor Developments

The Emerging Patterns

By S. HERBERT UNTERBERGER

another P.Q. exclusive

SINCE the end of World War II practically every employer-union relationship has been influenced by the patterns established in the automobile and steel industries. While the coal industry has also been important, the results of its bargaining has rarely been felt directly by the average employer. Rather, the gains won by the union in the coal industry have set goals which the unions in the steel and automobile industries have tried to match or exceed.

Immediately after the war, both the steel and automobile industries gave wage increases of 18½ cents an hour. This virtually established a pattern which spread into every corner of the United States.

Thereafter, in the spring of 1947, the steel industry granted a wage increase which averaged about 15 cents an hour and the automobile industry followed with an 11½-cents-per-hour increase. This set the level for the so-called "second round" of wage increases. Most other companies granted increases in the same neighborhood.

Again in the spring of 1948 the automobile industry upped rates by 11 cents and the steel industry by an average of 13 cents an hour. However, in granting its 11 cents an hour, the automobile industry started a new trend, the effect of which was to be felt far and wide.

Of the 11 cents an hour, 6 cents was designated as a general increase to be added to the base rates of each classification. The remaining 5 cents was designated as a cost-of-living allowance, to be adjusted up or down each three months in accordance with changes in the consumers' price index of the Bureau of Labor Statistics. This was the first major industry to adopt cost-of-living adjustments as a definite policy.

The effect was not only that employers in other industries were required to follow suit; the government also found it necessary to adopt cost-of-living adjustments as a part of its wage stabilization policy.

One other feature in the 1948 automobile contract was also to start a fresh trend which is still developing. It provided for a later increase of 3 cents an hour as an "annual improvement factor". This was supposed to provide a regular method for worker participation in increasing productivity.

In 1949 and 1950, the initiative for starting a new pattern passed to the steel industry, when after extensive bargaining, public hearings, and a strike, that industry agreed to the establishment of non-contributory pension plans, as well as health and welfare programs to which both employers and employees contributed. The automobile industry, following the steel industry, established the same programs in the fall of that year.

After these developments requests for private pension and health and welfare plans spread all over American industry. This was an illustration of the secondary effect of a development in the coal industry. Actually, John L. Lewis had had his health and welfare program and pension program since 1946. This did not generate a widespread demand for similar benefits. Its primary effect was to encourage the steel union to secure similar benefits. Once the steel union got them, the dam broke and they were being won all over the country.

Thus, whether employers in other industries like it or not, their fates are heavily influenced by the settlements reached in the automobile and steel industries. Those industries have just completed their 1953 bargaining. It is likely that they have set another new pattern.

The Auto Settlement

Theoretically, the automobile contract was not open for changes this year. The fact that the Bureau of Labor Statistics had revised its consumers' price index gave the union a reason for requesting bargaining conferences, and after some hesitation the employers agreed to the meetings. These conferences produced several significant changes. The exact sequence of how these changes occurred as the bargaining proceeded from General Motors to Ford to Chrysler and then back to General Motors is not too important. Here are the final results, with which other employers will have to reckon.

1. Since 1948, when cost-of-living wage increases were first begun, they have amounted to 24 cents an hour. These increases could have been lost if the cost-of-living turned downward. To avoid this, the employers and union agreed to add 19 cents to the base rates, leaving only 5 cents to fluctuate with the cost-of-living index. This also eliminated an inequity created by the Wage Stabilization Board's cost-of-living policy whereby other workers were permitted to receive cost-of-living increases which could not later be taken away.

2. The policy of adjusting wages with changes in the cost-of-living was continued, using the revised B.L.S. Index as the base for figuring adjustments starting June 1, 1953.

3. The "annual improvement factor," which was introduced at the rate of 3 cents an hour in 1949, had been raised to 4 cents an hour in 1950, 1951, and 1952. It was now increased to 5 cents an hour for 1953 and 1954.

4. The maximum benefits for workers who retire on full pensions were raised to $137.50 per month, including Social Security payments.

The Steel Settlement

The Steel contract was open this year only for wage adjustments. Even here, in the course of bargaining, certain other things were agreed to:

1. A general wage increase of 8½ cents an hour to be added to the rate of each job classification was bargained.

2. The elimination of the north-south 5-cents-per-hour wage differential for the same work was agreed to in two steps: 2½ cents an hour is to be added to southern wage rates on January 1, 1954, and another 2½ cents on July 1, 1954.

3. A joint union-management study of improved pension and welfare programs will be undertaken, but no action will be taken on these matters until the next contract negotiations in June, 1954.

The 1953 Pattern

If history repeats itself, it is clear that many employees outside of the automobile and steel industries will be agreeing to wage increases in the neighborhood of the adjustments in those industries—5 and 8½ cents, respectively.

Furthermore, it is likely that most of the reversible cost-of-living increases will be incorporated into the base rates—at least those granted up to the end of the wage stabilization program. This is in line with the action of the trend-setting automobile industry.

Similarly, annual improvement factors are likely to be increased somewhat.

Finally, the push is on to improve pension and health and welfare programs, immediately, or at the latest next year.

15,000,000 Tons of Solidified Petroleum Basis of Big-Time Business

By HARRY F. UTLEY

Busy ants piqued a man's curiosity, and that led to a new industry.

another ON THE SPOT report

Lying within a belt 30 miles wide and about twice that long in the Uintah Basin in eastern Utah are the world's only known commercial deposits of gilsonite.

The mineral, a heavy hydrocarbon described by some geologists as an "asphaltite," is widely used throughout the world. Important industrial uses are in the manufacture of storage-battery cases, paints and varnishes, asphalt tile, and a wide variety of molded products. Recently the material has been in great demand in the preparation of "underseal" for application beneath the bodies of automobiles, where it acts as an insulator, a sound deadener, and protection against the corrosive action of salt and calcium chloride used on roads and streets.

The mineral is named for its discoverer, Captain Sam Gilson, a pioneer figure of the region. Legend has it that some time around 1880, while prospecting in the Uintah, Captain Gilson observed colonies of ants carrying glistening, black particles to the surface. With his prospector's pick, he dug up some of the hard, jet-black material and soon discovered that it was not coal, tar, or pitch—and that it did not soften under the heat of the summer sun. There is no record that he ever realized anything from the discovery of the mineral destined to bear his name.

At the Craig (Colo.) plant the gilsonite is packed in 100-lb. valve-type bags by machine.

About 80,000 tons of gilsonite are now mined, processed, bagged and shipped from the Uintah Basin annually, three-fourths of it by one concern, the American Gilsonite Company of Salt Lake City. Smaller operators include the Castle Peak Mining Company, the American Asphalt Company, the Utah Gilsonite Company, and the Raven Mining Company.

The American Gilsonite Company is jointly owned by the standard Oil Company of California and the Barber Oil Company (formerly Barber Asphalt Corporation) of New

This 15-ft. wide gilsonite vein, shored to prevent caving, illustrates how the material is taken from the narrow open cut. This particular vein runs 8 miles through the barren Uintah Basin.

A perspective in the narrow mine cut. For safety's sake, blasting is done with carbon-dioxide cartridges instead of dynamite.

This 4-cu. yd. scraper bucket brings the broken gilsonite out of the cut being mined and up the incline to a truck-loading bin.

A truck-trailer being loaded with finely-sized gilsonite for transportation to the Craig packing plant or the melting-injection plant.

York City. Mining and processing are carried on near Bonanza, Utah. After cleaning and sizing, the gilsonite is trucked in 23-ton bulk loads to the company's storage and packing plant on the D. & R. G. Railroad at Craig, Colo., 125 miles distant.

The deposits of gilsonite are unusual, occurring as narrow, vertical veins between sheer sandstone walls. They vary in width from a few inches up to 20 ft. Some of the veins run on for miles without a break, and the depth, while not exactly known, is believed to exceed 1,400 ft.! None of the veins has been excavated to the bottom, the deepest penetration to date having been about 800 ft. Reserves are estimated to be at least 15,000,000 tons.

Two of the wider veins are being worked by the American Gilsonite Co., one as an open-cut, the other as an underground tunnel. Carbon-dioxide cartridges, electrically detonated, are used instead of dynamite for safety reasons, to loosen the inflammable material. The gilsonite is then removed from the cut by a 4-cu. yd. scraper, a hoist pulling the loaded bucket up an incline at the end of the run to discharge the jet-like material into a loading bin. After simple processing involving only crushing, screening, and washing, the gilsonite is ready for market. Three size ranges, from about ¾-in. down to finely pulverized, are ordinarily produced, and quality is graded as "standard" and "select", depending upon melting point and viscosity. The melting point ranges between 270 and 375 deg. F.

Since gilsonite is actually solidified petroleum, some of it is utilized as liquid petroleum. An injection plant was built recently at Bonanza for introducing the melted gilsonite into a nearby crude-oil pipeline running from the Rangely, Colo., oil fields to the refinery at Salt Lake City. One ton of gilsonite will yield about 5½ bbl. of oil. It is reported that the conversion process has been suspended for the time being, however, because of a too-low price for heavy oils. The melting-and-injection plant have been placed on a stand-by basis.

Much of the product is marketed by two Standard Oil subsidiaries—the American Bitumuls Company of San Francisco and the Canadian Bitumuls Company, Ltd., of Leaside, Ont.

E. F. Goodner is president of the American Gilsonite Co.; other officials include R. E. Nelson and Earl H. Owen. John H. Baker is superintendent of operations at Bonanza.

Alternate Velocity

(*From page* 214.)

theoretically differs sharply between the two methods of detonation. With the cored material, explosive pressure develops at an ever increasing rate. With detonation along the periphery, the initial rate of development is slower, followed by a fast rise then a tapering off effect.

To sum up, explosive velocity of the cartridge itself appears to be a tool which may work to the quarry operator's advantage. Atlas Rockmaster or millisecond delay blasting varies the timing of a blast. Alternate-velocity loading, used in conjunction with millisecond delay caps, varies both the timing and the velocity. Results indicate that the combination may offer sharply improved blasting efficiency with better control and at considerable savings.

Pioneer Ships Rock Crushers Worth $60,000 to Arabia

Pioneer Engineering Works, Inc., 1515 Central Avenue, Minneapolis, Minn., a subsidiary of Poor and Company, Chicago, announces shipment of two rock crushing plants to Dhahran, Saudi Arabia.

The plants are Pioneer's Model 130-S, each consisting of a 30- by 18-in. roll crusher, a 3- by 10-ft. 3½-deck vibrating screen, and the necessary channel frame conveyors—all portably mounted. The three axles supporting each plant are equipped with twelve wheels mounted with 9:00 x 20 pneumatic tires. Each plant will be driven by a Buda diesel power unit, Model 4DC-645.

These plants, purchased by Fluor Corporation, Ltd., from Overseas Equipment Corporation, New York City, for approximately $60,000, will be used for construction work in Saudi Arabia.

personal mention

P. S. Hass

PETER S. HASS, formerly assistant works manager at the Permanente Cement Company's plant, at Permanente, Calif., has been appointed executive assistant to the firm's vice-president and general manager, Wallace A. Marsh, with headquarters in Oakland.

Mr. Hass joined the company six years ago as an engineer and administrative assistant. He was in charge of developing Permanente's unique nodulizing process through which kiln dust is re-used to increase the plant's capacity by 200,000 barrels of cement per year.

WILLIAM H. HARDING, director of research for the National Gypsum Company, Buffalo, N. Y., has been appointed a member of an eight-man editorial advisory board for publications of the American Chemical Society.

FRANK J. CAIN JR., who has been general sales manager for the Carolina Giant Cement Company at Columbia, S. C., and previously North Carolina representative for the Giant Portland Cement Company, has been elected vice-president in charge of sales for both companies.

ROBERT F. BLACK, president of the White Motor Company for the last 18 years, has been elected a director of the Medusa Portland Cement Company. He will fill the vacancy caused by the death of Alva Bradley.

GEORGE W. HANDY, commodity manager, acoustical sales, National Gypsum Company, was recently re-elected president of the Acoustical Materials Association at the 23rd board of directors meeting of the organization. Mr. Handy has been a member of the board since the founding of the association and has served on several committees.

ERNEST C. MCDONALD JR. was recently named head of the technical service laboratory of the Georgia Marble Company's calcium products division at Tate, Ga. This new customer facility is scheduled to begin full operation soon.

Several changes have been announced on the staff of the United States Gypsum Company. ALAN B. COOK has been named assistant to H. F. Sadler, vice-president in charge of sales. Mr. Cook was formerly manager of the firm's Lake Shore Chicago district.

Succeeding Mr. Cook in this post is GEORGE B. HALLOWELL JR., who was assistant sales manager of plaster products.

LYLE F. YERGES has rejoined U. S. Gypsum as manager of product development for industrial products.

GUS C. HINUEBER recently joined the staff of the Portland Cement Association at Chicago, effective May 10. He is assistant to Milton Hlava, advertising manager of P.C.A. Mr. Hinueber, an alumnus of the University of Illinois, was for four years the director of public relations at Blackburn College, Carlinville, Ill.

TOM MACNIDER has been named a director of the Northwestern States Portland Cement Company, Mason City, Iowa. At the same time Mr. MacNider was made assistant to the president.

ROBERT A. COSTA, who for the last three years was administrative assistant to the general sales manager of Kaiser Gypsum Company, Inc., has been appointed assistant general sales manager, effective June 1. The announcement was made by Claude E. Harper, vice-president and general manager of Kaiser Gypsum. Mr. Costa came to Kaiser Gypsum from the Arabian American Oil Company, in San Francisco, where he was administrative assistant to the chief engineer.

GRAHAM MORGAN, general merchandise manager of the United States Gypsum Company, was elected president of the Gypsum Association at its annual meeting in Chicago. He succeeds Noel J. Redmond, president of the Blue Diamond Corporation of Los Angeles, Calif.

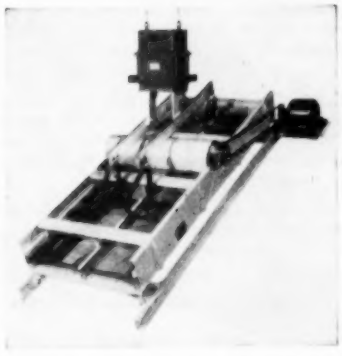
LLOYD M. BOWDEN, secretary and legal counsel of Consumers Company of Chicago, was elected vice-president and secretary. At the same time REDMOND J. DWYER, assistant counsel, was named assistant secretary.

ROBERT B. MARSHALL was recently elected a director and appointed to the executive committee of the Bessemer Limestone Cement Company of Youngstown, Ohio.

AN UNBEATABLE COMBINATION FOR YOUR TROUBLESOME FINE SCREENING!

UNIVERSAL SCREENS AND UNILEC HEATING EQUIPMENT

THE WELL-KNOWN CAPACITY OF THESE SCREENS FOR HANDLING DIFFICULT SEPARATIONS IS NOW EVEN GREATER WITH THE ADDITION OF UNILEC EQUIPMENT.



Real economy and production can be had by employing UNILEC when seasonal moisture conditions demand it, and reverting to the non-heated Screen when the material is dry. UNILEC equipment is easy to install and the change over can be made quickly.

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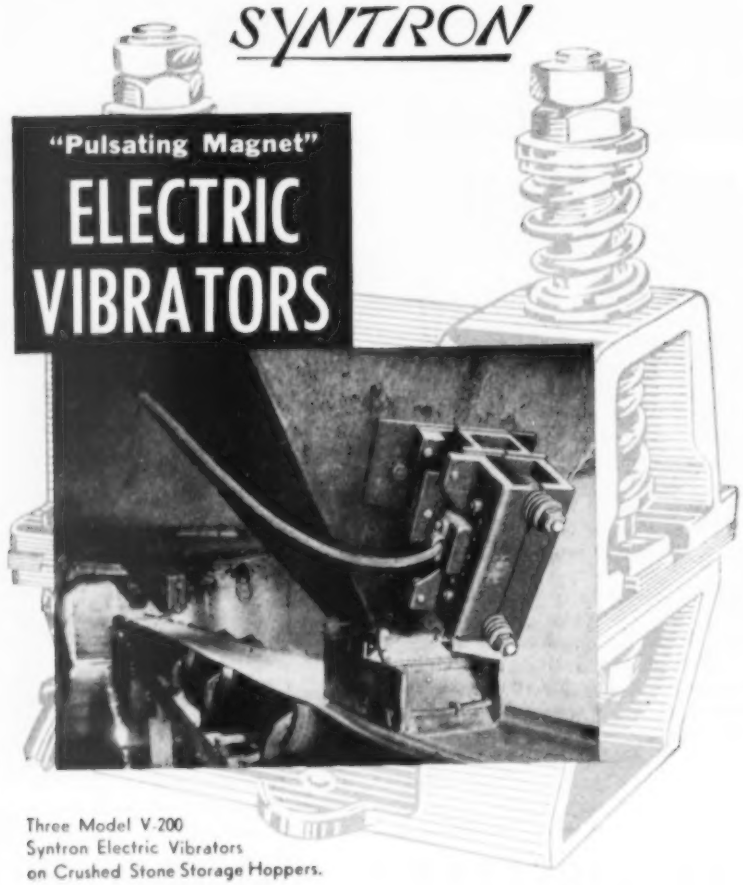
RACINE — WISCONSIN

SYNTRON

"Pulsating Magnet"

ELECTRIC VIBRATORS



Three Model V-200
Syntron Electric Vibrators
on Crushed Stone Storage Hoppers.

Syntron Vibrators assure fast, smooth, economical processing of bulk materials. Their 3600 electro-magnetic vibrations per minute keep even the most stubborn materials flowing freely through bins, hoppers and chutes. They eliminate shut downs due to clogging, arching, or plugging of materials.

Pulsating magnet construction plus variable power control means a positive flow of fine powdered materials or large chunks. No more damaged equipment from poking, rodding and sledging to loosen clogged spots.

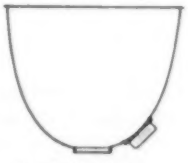
Available in models and sizes for installations ranging from small hoppers to large storage bins—Syntron Vibrators reduce maintenance and increase production.

Write today for complete catalogue information.

Ask about models designed for your application.

APPLICATIONS

Conical or Rectangular Hoppers



Parabolic Hoppers

Flat Bottom Bin with Center Discharge

Wooden Hoppers

Concrete Hoppers

Inclined Chutes

Hopper with Sloping Discharge

SYNTRON COMPANY

385 Carson Avenue Homer City, Penna.

HOWARD H. STURDY, vice-president of the Dravo Corporation, Pittsburgh, Pa., has been elected president of the Constructors Association of Western Pennsylvania.

Promotions for three members of the central research department of the Minnesota Mining & Manufacturing Company have been announced.

DR. MATTHEW W. MILLER was named business manager and DR. ALVIN M. BORDERS and DR. HAROLD M. SCHOLBERG were named associate directors of the central research department.

Dr. Miller joined 3M as a research chemist in 1947. His most recent position has been as an assistant director of the department. He is chairman elect of the Minnesota section of the American Chemical Society.

Dr. Scholberg will head the physics, inorganic chemistry, and physical chemistry sections of central research. He joined 3M as a senior chemist in 1944 and was made leader of the electrochemical section in 1948. Three years later he was named assistant director of central research.

Dr. Borders was engaged in synthetic rubber research with the Goodyear Tire & Rubber Company and did research work with the Institute of Paper Chemistry from 1948 until 1950, when he joined 3M. He was named a section leader of the central research department in 1951.

National Gypsum Company officials have announced the appointment of DR. J. EDWARD LYNN as director of basic research. Dr. Lynn was formerly director of the textile chemicals laboratory of the American Cyanamid Company Research Laboratories in Stamford, Conn.

THOMAS R. MALLON has joined the staff of Texas Industries, Inc., Dallas, according to Ralph B. Rogers, president, Mr. Mallon was formerly assistant to the president of Corhart Refractories Co., Inc., at Louisville, Ky.

MELVIN H. BAKER, chairman of the board, National Gypsum Company, recently received the degree of Doctor of Commercial Science at the commencement exercises of Carson-Newman College, Jefferson City, Tenn. Mr. Baker, who delivered the commencement address, is an alumnus of the college.

HERBERT W. POPE, who was formerly assistant to the president of the Dragon Cement Company, Inc., recently resigned from this post. Mr. Pope joined the cement firm's staff in February of 1929 and spent the major portion of his time in the sales department.

L. W. ROGERS of the Consolidated Cement Corporation's Fredonia Division has been elected a vice-president of the company. He has been with Consolidated since 1919 and was made sales director in 1928.

Three appointments were recently announced by officials of the Colorado Fuel and Iron Corporation:

MORTON E. WEICHSEL was appointed manager of industrial engineering after having served as superintendent at the Minnequa works since February, 1947. He has been with the firm since 1925. He began as a millwright in the coke plant, and subsequently served as junior industrial engineer, assistant to the superintendent, and superintendent of the industrial engineering department.

FRANK F. ARGUST has been named superintendent of industrial engineering to succeed Mr. Weichsel. He has been associated with the corporation in various capacities, including the posts of junior industrial engineer, senior industrial engineer, and assistant superintendent.

DEAN B. VALENTINE is the new assistant to Mr. Argust. A C.F.&I. employee since 1941, he has been senior industrial engineer for the last six years.

Election of DR. H. N. STEPHENS as vice-president in charge of central research has been announced by Minnesota Mining & Manufacturing Co. Dr. Stephens has been in charge of the central research laboratory since 1937. From 1927 to 1937, while an assitant professor of chemistry at the University of Minnesota, he was a research consultant to 3M.

RICHARD SCOTT has been made superintendent of production for five plants of the Penn-Dixie Cement Corporation at Nazareth, Pa. Mr. Scott was assistant superintendent at the Independence, Kans., plant of the Universal Atlas Cement Company for 15 years. He went from there to Chicago as manager of manufacturing research for the Portland Cement Association. Later he was associated with the Medusa Portland Cement Company at Toledo, Ohio.

JAMES R. CARR has been promoted to the post of mine superintendent at the Heath, Mont., plant of the United States Gypsum Company after having served there for a year as mine engineer. Mr. Carr will be in charge of mining, crushing, and belt haulage operations. He succeeds GERALD C. MATHIS, who recently accepted a position with the National Lead Company in San Luis Potosi, Mexico.

CHARLES R. PARKS, 69, former treasurer of the North American Cement Company, died on May 21 in Albany, N. Y. He had been ill since March, when he was stricken while on a vacation at Saratoga, Fla.

Mr. Parks, known nationally in the cement industry, had been with the North American firm and its predecessor, the Helderberg Cement Company for 49 years before his retirement.

Mr. Parks began working for Helderberg as a clerk and rose to an executive post, that of treasurer when the firm consolidated with the North American Cement Company in 1926. For many years he was in charge of offices in Albany and New York City.

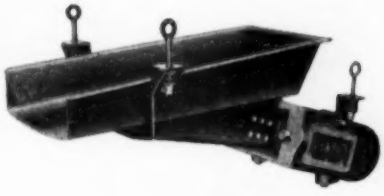
Over 250 Tons of Gravel Per Hour

with a SYNTRON

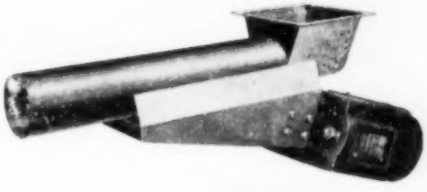
VIBRATORY FEEDER

Powerful electromagnets, vibrating 3600 times per minute, enable Syntron Feeders to handle huge quantities of heavy bulk materials with speed and economy. Vibra-flow design causes materials to flow like water. Finger-tip controlled feeding assures a smooth, even flow of heavy lumps or fine powders.

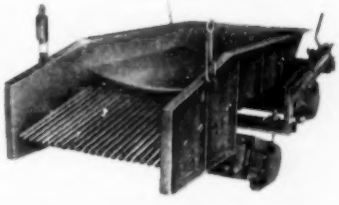
Syntron Flat Trough Feeders are available in models capable of handling up to 1200 tons per hour of heavy ore, rock, etc. Have no gears, cams, belts, etc. that require expensive replacement.



Tubular Trough Models increase the capacity of rotary kiln, drier and mixer operations where dust is a problem. Uninterrupted production with almost no trough abrasion.



Syntron Vibrating Grizzlies feed and coarse size in one operation. Grizzly bars are non-binding — tapered — wear resistant. Available with single or multiple magnets.



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SYNTRON COMPANY

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"There's an Insley working near you"

INSLEY

The Insley Manufacturing Corp. of Indianapolis has been manufacturing construction equipment since 1907. The Insley Line includes excavators and cranes, 5 to 30 ton capacity—rubber or crawler mounted—gasoline, diesel or electric powered. There's an Insley working near you.

"There's an Insley working near you"

ARTHUR R. CAHILL has been elected assistant treasurer of International Minerals and Chemical Corporation, according to an announcement made by President Louis Ware. He will be on the staff of Robert P. Resch, vice-president and treasurer of the corporation.

ANDREW J. WATT, formerly assistant to the vice-president in charge of sales for the United States Gypsum Company, has been named to the newly created position of assistant general merchandise manager.

WILLIAM MITCHELL has been promoted to the position of assistant plant manager and production superintendent for the Clarence Center, N. Y., plant of the National Gypsum Company. He joined the company in 1941 at Alexandria, Ind., interrupting his work to serve in the armed forces during World War II. After receiving his B.A. degree at Indiana University, he returned to National Gypsum and was transferred to New York.

R. D. STEPHAN was recently elected to the new post of vice-president, dealer sales, for the United States Gypsum Company. At the same time it was announced that G. J. MORGAN had been named merchandising vice-president.

ARTHUR WILSON, who for 42 years has supervised the Huron Portland Cement Company's shale operations, retired recently. Four years before he was made quarry superintendent, he had joined the Huron staff as an engineer. This was in 1907, during the time the plant was under construction at Alpena.

Mr. Wilson, familiarly known as "Mr. Shale Beds", was graduated from the International School of Engineering in Chicago in 1907, and immediately began working for the cement firm.

Five promotions have been announced by spokesmen of the West Virginia Black Rock Company, Charleston, W. Va.

JAMES L. LEHMANN, assistant sales and plant manager of the Charleston operations since 1946, was named general sales and production manager.

W. H. JONES, assistant sales and plant manager at Clarksburg for the last eight years, is now general operations and maintenance manager in Charleston.

R. MACKAY SMITH, formerly in charge of the firm's portable plant at Lookout, W. Va., will replace Mr. Jones at Clarksburg.

BEN HIGGINS, who was plant superintendent at Lookout, was promoted to plant manager and superintendent.

ROBERT KITCHEN was moved up from the post of superintendent of the Ravenswood, W. Va., portable plant to plant manager and superintendent.

F. L. STELLNER, secretary of the United States Gypsum Company, has been elected a director of the company. He succeeds DONALD B. LOURIE, who resigned to become Under Secretary of State.

New York Trap Rock Corporation officials recently announced several executive appointments.

FLOYD BUFFINGTON has been appointed vice-president in charge of operations and a director of the company, succeeding DEXTER BULLARD, who has resigned.

CLARENCE STETSER, former superintendent of the Clinton Point plant, Poughkeepsie, N. Y., has been appointed general superintendent of the company, and GEORGE WHITE, assistant superintendent of Clinton Point, has been made superintendent.

Mr. Buffington joined Trap Rock in 1936 after serving in the construction material business. He began as the company safety engineer, and developed Trap Rock's present safety program, which has improved safety records year after year. In addition, Mr. Buffington has been active in industrial safety work both in New York state and nationally. In 1944 he was put in charge of the Real Estate and Insurance Department, and in 1948 was appointed assistant to Vice-President Dexter Bullard.

Mr. Stetser has been connected with Trap Rock since 1929—first as chief electrician, then assistant superintendent of the Clinton Point plant, and finally superintendent.

Mr. White, who becomes superintendent of the Clinton Point plant, has been with the company almost 40 years, starting in June, 1914, as engineer at the Verplancks plant in Peekskill.

National Gypsum Company has announced the promotions of ROBERT E. SCIFRES to production manager of gypsum plants and R. E. GILL to production manager of lime plants.

Formerly assistant production manager of gypsum plants, Mr. Scifres studied at Purdue University and the Massachusetts Institute of Technology graduate school. He has been with National Gypsum for 11 years. Mr. Gill, previously superintendent of two of the company's largest lime plants and production engineer, has served the company for 17 years.

Several organizational changes have been announced by U. S. Gypsum Company officials for the plant at Sweetwater, Tex. They are as follows:

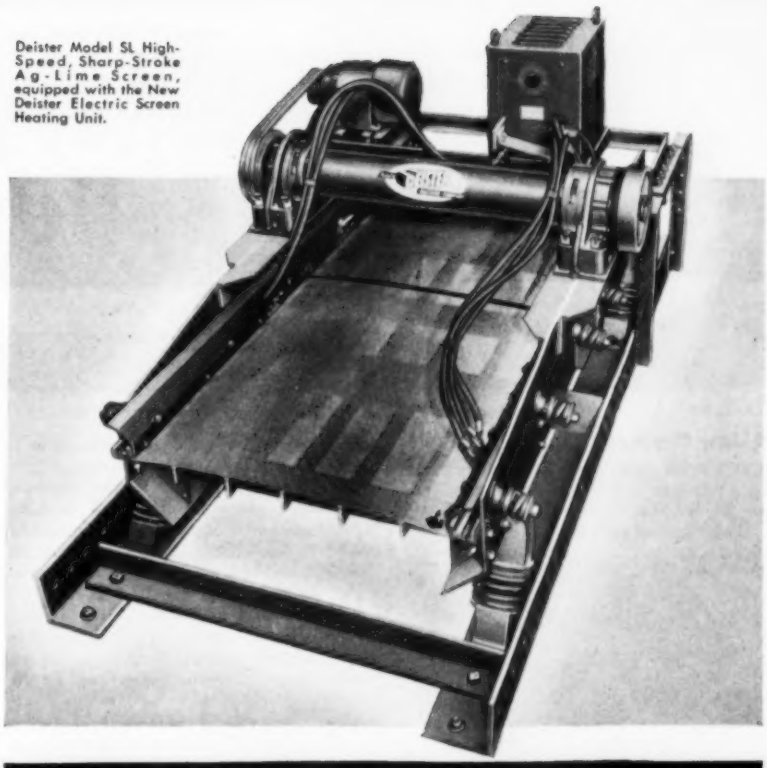
L. A. TOBY, formerly in charge of paint operations, has been named production engineer. He went to Sweetwater from Chicago in 1947 to assist in the construction of the plant.

A. L. MONDY has become superintendent of the paint plant. Mr. Mondy was previously general foreman in charge of paint plant production.

C. E. ISOM, formerly in the quality control department, is the new general production foreman; he will also have the responsibilities of general manager of paint plant production.

W. H. MCNEIL, who went to Sweetwater in 1949 as project engineer, is now assistant plant engineering superintendent.

Deister Model SL High-Speed, Sharp-Stroke Ag-Lime Screen, equipped with the New Deister Electric Screen Heating Unit.



For DAMP, STICKY AG-LIME

DEISTER SCREENS

High-Speed Ag-Lime Screen
With DEISTER Electric Screen Heater

"Improved separation of ag-lime—with increased tonnage per hour" . . . that's the report from 100% of the users of the new Deister High-Speed Ag-Lime Screen equipped with a Deister Electric Screen Heating Unit.

The Model SL Deister *unitized* vibrating mechanism is engineered for extreme ruggedness, with dead weight *eliminated* to permit the extremely rapid stroke-cycle necessary for maximum separation efficiency of fine, moist materials.

And now, with the new Deister Electric Screen Heating Unit, which relieves the surface of moisture, screen cloths are really kept *open*. Pounding and brushing to remove blinding material is *eliminated, lengthening cloth life up to three times.*

• • •

Write or phone for specific information on the new Deister High-Speed, Model SL Ag-Lime Screen with the Deister Electric Screen Heating Unit . . . and how it can increase and improve the sizing of your ag-lime . . . and lower production costs.

DEISTER MACHINE COMPANY
FORT WAYNE 4, INDIANA

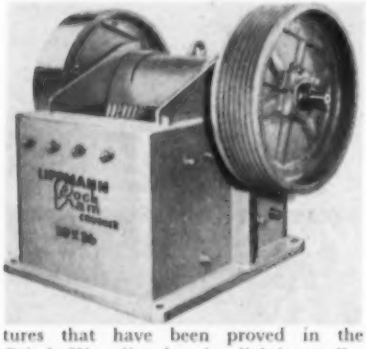
new machinery and supplies

PIT AND QUARRY

• Jaw Crusher

A line of fabricated jaw crushers has been announced by the *Lippmann Engineering Works.*

The "Rock-Ram" line contains the features that have been proved in the Grizzly-King line but in slightly smaller sizes. The new line is being made in 10x16, 10x20, 10x24, 10x36, 15x36, 20x36, and 30x36.



• New Mack Truck Line

A completely new truck line, designed around the needs of the operator, has been introduced by *Mack Trucks.* It includes trucks and tractors in 4 and 6-wheel types, ranging from 17,000 lbs. GVW to 70,000 lbs. GCW, with gasoline or diesel power up to 170-hp.

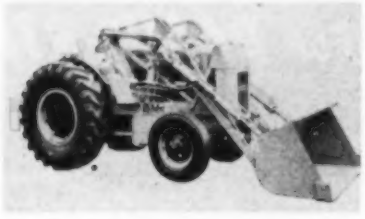
The highest possible payload capacity, one of the advantages claimed for the new models, has been achieved through more compact construction and lighter chassis, axles, transmission cases and wheels. The distance from front bumper to back of cab has been reduced to permit longer trailers or bodies, with increased capacity. A very compact engine, mounted well over the front axle, is readily accessible for quick servicing (illus.).

New transmissions, new axles, a cab designed for maximum driver comfort, increased maneuverability and steering efficiency, and many other refinements of Mack's well-known design components are featured in these new B series models.

• Hydraulic Loader

A hydraulic shovel loader designed to fit Case, Minneapolis-Moline, Shepherd and Oliver tractors is being made by the *Baker-Lull Corp.*

The Baker-Lull "Shoveloader" has a material bucket for loading and unloading of all types of materials. Other attachments are coal or snow bucket, bulldozer, crane, sweeper, rear leveling blade scarifier, and logging fork. It is said that the location of all operating parts ahead of the operator makes for greater safety, and that the design of the bucket and lifting arms permits digging below the tractor level and dumping into trucks, hoppers or bins.



• Heavy-Duty Motor Oil

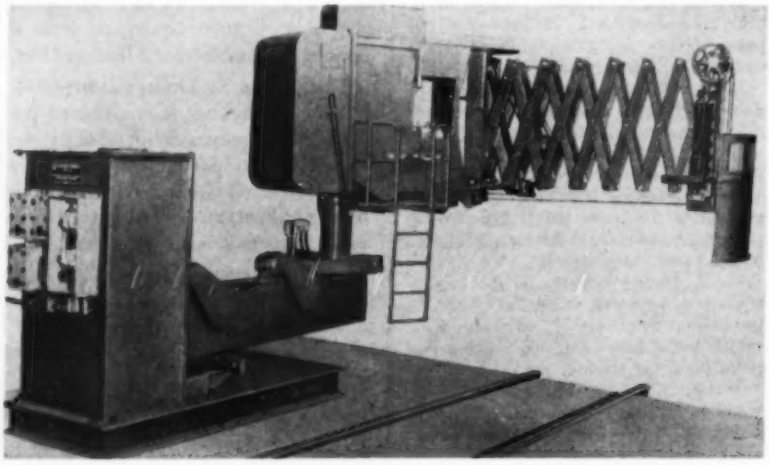
Developed to meet the needs of today's gasoline and diesel engines, a new Lubriplate motor oil is being offered by *Fiske Bros. Refining Co.* It is said to be especially good for engines equipped with hydraulically-operated valve lifters, increasing their power while cutting fuel consumption.

Detergent and dispersant additives are used in the new oil to keep the engine clean and free of sludge and carbon, holding small particles in suspension to prevent clogging of oil lines, screens, etc. Oxidation and corrosion inhibitors are incorporated into the oil to keep the engine cleaner, making the oil last longer and reducing friction and wear.

• Box Car Unloader

A box car unloader that is mounted between two tracks has been brought out by *Stephens-Adamson Mfg. Co.*

The unloader can handle all bulk material up to 2 in. in size. A pantograph arm reaches into the car until it meets an obstruction, then a scoop is dropped down and retracted causing a load of material to be discharged into a trackside hopper. This continues with only occasional changes being made to direct the arm to different sections of the car. The device needs only a single concrete footing for mounting (below).



● Smaller Pan Trailer

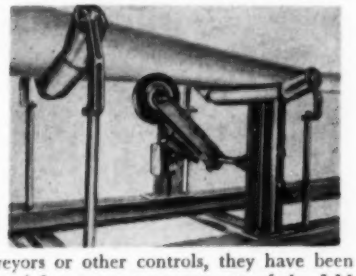
Newest addition to the *Easton* line of side-dump, pan-type trailers for quarry and mine service is a small model with a 10-ton capacity 8 cu. yds.). Except for the smaller dimensions, it is identical in every way to the larger Easton pans, fea-

turing reversible two-way dumping, all-welded ⅜" plate with sturdy box-section reinforcement and an oak floor cushion.

To avoid excess wear on one side, the body can be reversed from end to end. The cab protector plate shifts also. The trailer stabilizer, designed to rest on the hopper wall during dumping, can also be changed from side to side. The new model, TP-810, is fitted with Easton No. 20 rubber mounted quarry-type fifth wheel, a standard Easton axle with springs, BK vacuum brakes and 10.00x20.14 dual lug tires.

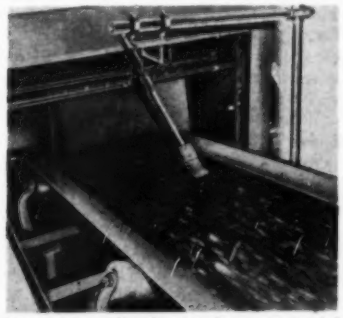
● Conveyor Controls

Two devices for controlling conveyors and chutes have been made available by the *Johnson-March Corp.*, Philadelphia. Adaptable to any materials handling system for setting off signals, auxiliary con-



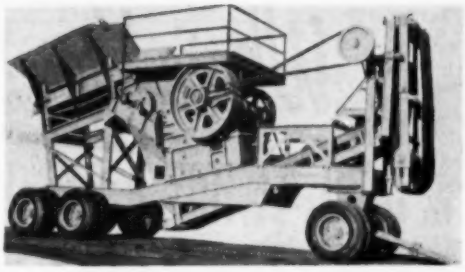
veyors or other controls, they have been used for years as components of the J-M dust control system.

One unit (upper picture) is installed under the belt, and is especially useful

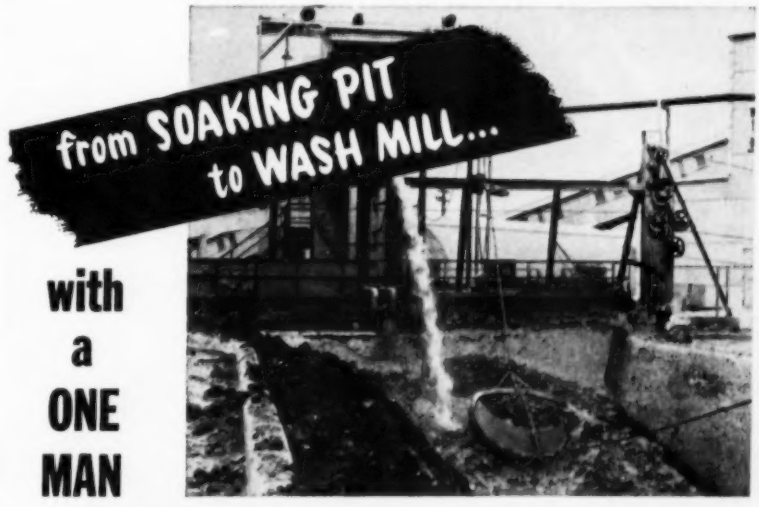


with coarse, abrasive or lump materials. A deflection of as little as 1/16-inch actuates it. The other device, mounted over the belt, closes the switch by means of a paddle arm, and is recommended for fine, lightweight materials.

● Portable Crusher



Less load on the jaw crusher features this new Cedarapids portable primary crushing plant, completely redesigned but retaining all features of previous models. Undersized fines and dirt are bypassed from the jaw crusher by a vibrating grizzly, which helps to keep clays and other compacting material out of the crushing chamber. More crushing space, higher capacity and lower maintenance result, *Iowa Mfg. Co.* says. The 40x48-in. grizzly deck come with openings from 2½ to 6-in. It uses a circle throw action to eliminate dirt and fines. Model AAA-GR can be had with 22x36 or 25x40 crushers, and an 8 or 12-ft. 36-in. apron feeder. It has a 7x4-ft. hopper and a channel-type, clutch-controlled 30-in. x 28-ft. delivery conveyor with a 10-ft. discharge clearance. The plant is mounted on a semi-trailer.



with a ONE MAN

SAUERMAN SCRAPER

Using oyster shell from Mobile Bay and clay from the company's own deposit at West Baton Rouge, La., Ideal Cement's portland cement mill produces 6,000 barrels of cement per day. The clay, dumped by trucks into a soaking pit, is moved to the wash mill by a 2-cu. yd. Sauerman Scraper. Because of the nature of the material, the Crescent scraper bucket must be able to move freely from side to side of the pit in order to do a good job. This is accomplished by attaching the scraper cables to a monorail-trolley system at the front and rear of the soaking pit. The scraper handles 40 tons of clay per hour with a smoothness and economy of labor that further increases the overall efficiency of this mill.

Savings in labor costs, economy of operation, and rapid hauling are just three of the advantages provided by Sauerman Drag Scrapers. One machine — one man — efficiently controls the entire operation. Sauerman Scrapers have proved themselves in hundreds of applications all over the world. Better performance, less wear and maintenance mean more profits for you. Your inquiries are invited on a size and type Sauerman machine to suit your needs. Buckets range from ⅛ to 15 cubic yards. Gasoline, diesel, or electric powered.

Write for Illustrated Catalog E, "Bulk Storage by Power Scraper"
Sauerman Bros., Inc., 534 S. Clinton Street, Chicago 7, Ill.

ONE MAN MATERIALS HANDLING

SAUERMAN BROS., INC.

What's Your Line?

In Mining Service... the Answer is NAYLOR

Whether your line is for high or low pressure air, water, or what have you—Naylor lightweight pipe takes the guesswork out of your piping requirements. It's your best bet for all-around service in mining operations.

Write for Bulletin No. 507

NAYLOR PIPE COMPANY
1257 East 92nd Street, Chicago 19, Illinois
New York Office: 350 Madison Avenue, New York 17, New York

• Portable Dryer

A completely portable dryer for drying or thawing aggregates of all kinds has been brought out by *Barber-Greene Co.*

The "Dryall" unit is a trailer mounted machine with a revolving drum of 3 cu.

ft. capacity. The drum elevates the aggregates by means of a series of metal flights on the interior. These discharge the material through a blast of hot gas and flame supplied by an oil burner. When sufficiently dry or heated the material is discharged through a chute to a wheelbarrow. It is rated at 8 tons per hour capacity under normal circumstances. Loading is by a power operated skip with power supplied by an air-cooled gasoline engine.

• Sectional Conveyor

A sectional conveyor in channel type construction is being offered by *Transall Inc.*

The sections are made in 12 ft. lengths with all parts interchangeable. Idlers

are spaced to meet operating conditions and are heavy-duty permanently lubricated type with either 4 in. or 5 in. rolls. Channel side members can be furnished in bolted or dismountable construction. They are fastened to the supporting chairs with a hinged connection which allows for uneven floors. Optional protective decks are available in removable or permanent type. Special sections for controlling expansion and contraction can be supplied.

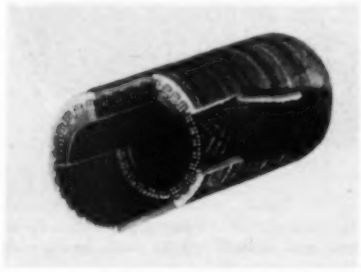
• New On-Off Tire

Maximum traction on harder surfaces and a full depth "bite" in the softest soils feature a new U. S. Royal tire. Having no center running rib, the tire bends and conforms to ground irregularities for constant grip and pull. Lugs extend beyond the center on each side at a special angle for self cleaning. A wide flat tread gives uniform wear, and has a special compound to resist cuts, snags and tears. Bonded cords give flexibility to the carcass and resist bruises and impact. The tire has a heavy sidewall scuffing rib.

• Heavy-Duty Air Hose

A heavy-duty air hose especially designed for rugged use in mines, quarries, and construction projects has been announced by *Quaker Rubber Corp.*

The "Qua-Flex" brand of hose has horizontally braided rayon cable cord reinforcements which withstands pressures up to 450 p.s.i. and remains flexible at -40 deg. F.

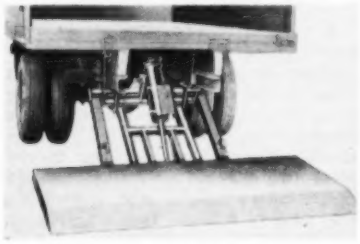


The hose has a non-porous tube compounded of special rubber to resist both oil and heat. There is an extra-thick wrapped rubber cover to protect the carcass from abrasion and to resist weathering and oil. Snaking of the hose at high pressures is also eliminated. The new hose is available in lengths to 50 ft. and with inside diameters from ⅜ to 2 in.

• One Cylinder Lift Gate

A single hydraulic cylinder is used to lower, lift and power close the lift gate of the Anthony Model "146" which has a rated capacity of up to 4,000 lb.

The single lift cylinder is controlled by a single lever control with a "Safety-matic" feature that stops the gate the instant the hand is removed from it. The one control is all that is needed to lower or lift and close the tail gate. The new model, with either general purpose or ramp type gates, is made in sizes for all models of trucks and semi-trailers according to the *Anthony Co.*



• Grit-Proof Idlers

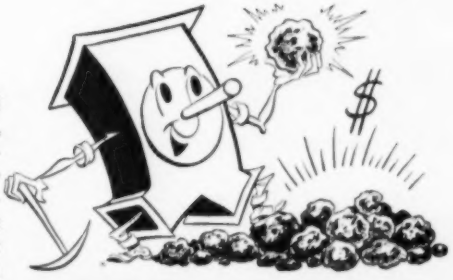
Savings in over-all conveyor operation are said to result from a new line of troughing idlers and return rollers being offered by the *Hambro Trading Co.* In the past, these idlers were not available to the general user.

Made of close grained, arbrasion and corrosion-resistant cast iron, the idlers have closed ends to keep out dirt, and use specially made SKF ball bearings to reduce friction, which saves on the power needs of the conveyor, Hambro says. Seamless steel tubing is used for the return idlers. A full range of sizes and types are available.

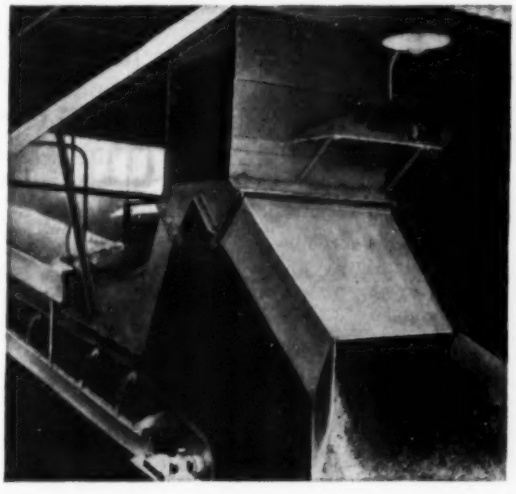
PITTSBURGH COKE & CHEMICAL Reports:

ERIEZ DRUM PULLS IRON FROM SLAG AND IT'S WORTH $40 A TON TO US!

ERIEZ Permanent Magnetic Drum removes 3 tons of iron daily!



"It's like finding gold . . ." says L. R. Forbrich, Cement Plant Superintendent of the Pittsburgh Coke & Chemical Company. Installed on a granulated slag drier, an Eriez Permanent Magnetic Drum has been working 24 hours a day . . . separating an average of 3 tons of scrap metal profits each week from granulated slag! The slag is used in the manufacture of the company's Green Bag Portland-Pozzolan Cement. "The Eriez Drum not only maintains our product's quality, but it reclaims valuable metal. This metal, as scrap iron, is worth about $40 a ton to us on today's market. The drum has paid for itself many times over."



Installed at the discharge of an open or closed chute, spout or screw conveyor, etc., the Eriez Magnetic Drum and Housing automatically, simply and economically removes tramp iron from chemicals.

Only the ERIEZ line of Drums has All These Features:

1. Stainless steel shell resists corrosion and abrasion.
2. Dust-tight construction standard at no extra cost.
3. Rigid, lightweight, compact, cast aluminum sides.
4. Sheave size easily changed for various operating speeds.

Write for new, FREE 6-page Drum Bulletin which describes all separator installations for the chemical industry.

ERIEZ MANUFACTURING COMPANY

41 Magnet Drive • Erie, Pennsylvania

"Buy permanent protection . . . by ERIEZ"

FASTER SCREENING

lower processing costs

For a few cents an hour, the Hanco Electric Screen Heater heats woven wire screens to

- speed screening of moist materials
- prevent blinding
- make it easier to meet specifications for fines
- eliminate cleaning labor
- eliminate screen wear due to cleaning abuse and extra weight of clogged screens.

Quick-Change Attachment for easy screen changes

- Distribution bars make direct contact with cloth eliminating current loss suffered when skirtboard is part of circuit . . . weak or broken circuits due to rusting.
- Distribution bars and insulations shielded from abrasion.

Write for Bulletin

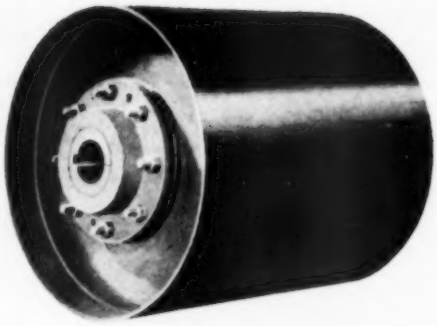
F. R. HANNON & SONS

Engineers
• Since 1926 •
Manufacturers
CANTON 7, OHIO

Hanco THE PIONEER ELECTRIC SCREEN HEATER

• Novel Pulley Hub

Modern belt and elevator conveying, with its high speeds and great loads, requires pulleys that will maintain adequate driving torque and do little travelling on the shaft. A new all-steel pulley offered by the *Wood Dale Machine & Mfg. Co.* features a "friction drive" hub to conquer these problems, and can be adapted to all standard pulleys. Keyseats and set screws are eliminated by the hub, a compression type with a simulated shrink fit.



• Truck Carries Huge Payload

Loads of 75 to 80 tons of sand were carried with ease during a recent demonstration of the new 60-ton *Dart* truck, the manufacturer reports. The behemoth is nearly 33 feet long, 11-ft. 8½ in. wide and 11½-ft. high. It is powered by two diesel engines having a gross horsepower of 700.

Reported to climb steep grades with ease and to handle comfortably, the huge truck rides on twelve tires that have a total tire capacity of 244,200 lbs. Steering is made easy through the use of twin double-acting hydraulic boosters that provide 56,000-lb. steering effort. A total of 2550 sq. in. of brake lining, all axles being fitted with 9x20 in. diameter brakes, governs the braking.

Each engine connects to the rear axle through separate torque converters of the Twin-disc 3-stage variety which have 5:1 torque multiplications and down-hill braking features. Each torque is charged from the diesel fuel supply and is cooled by a special heat exchanger. Transmissions are Twin-disc reverse box type with 1:1 forward and 1:1 reverse ratios.

Cast of high alloy steel, all axles have an 85,000-lb. capacity. The front axle has a center pivot that allows it to oscillate when travelling over irregular terrain. The tandem rear axles feature 5:1 reduction in the planetary wheel, providing an overall reduction that may be 12:57:1, 15:23:1 or 20:6:1 for complete coverage of operating conditions.

Twin hydraulic hoists, rated at 130,000-lb. push at 1000-psi pressure, have built-in snubber and pull-down mechanism. Extra reinforcement in the highest load positions help to reduce the stress on the frame, which is full box section 27-in. wide by 19-in. deep, with ¾-in. top and bottom plates and ⅜-in. side plates.

Each engine has a 34-gallon liquid cooling capacity. Mounted amid-ship, they are connected to the radiators at front by brass tubing. Each radiator has 118,432 sq. in. of radiation to dissipate engine and torque converter heat. The hydraulic system, operated by two vane-type pumps that handle a total of 144 gallons per minute at 1000 psi., is used for power steering and body hoisting. With a pump connected to each engine, the system remains active even though one engine stalls.

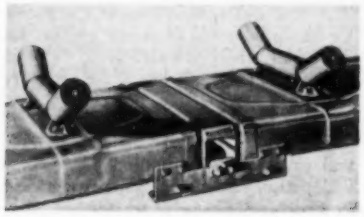
The new truck is supplied with either Buda, Cummins or Waukesha diesel engines. Tires are 18.00x25 of the 32-ply dual type.

• New Case Hardener

A newly-developed, fast acting metal surface hardening compound, said to combine the advantages of carburizing, nitriding and chromizing, has been introduced by *Doughty Laboratories*. Sold in powder form, "Hard 'n Tuff" contains special agents which speed up the impregnating process, permitting sufficient carbon to go into the steel surface in a few seconds to give high hardness on quenching. Bits, teeth, tools and other pieces of metal are rendered highly resistant to abrasion, the maker says. Used principally on low and medium carbon steels, the compound has shown excellent results on alloy and even high-speed tools steels, Doughty reports. No special equipment is needed for the treatment.

● Sectional Belt Conveyors

A sectional belt conveyor that uses lengths of inverted troughing to form a light, rigid structure is being introduced to the United States by the *Hambro Trading Co.* Already used in many parts



of the globe, its quick erection and removal permits a highly flexible conveyor system.

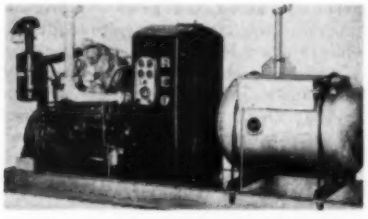
The troughs, 8 or 12 feet long, carry idlers spaced 4 feet apart. Supported at the ends in flight or on the ground, these troughs completely cover the return belting. Light in weight, each section locks to the one after it. The finished conveyor is only slightly wider than the belt it carries.

Made of close-grained cast iron for greater resistance to abrasion and corrosion, these trough belt roadway conveyors have closed ends to keep dirt out. Special SKF ball bearings and a special method of mounting the idlers is said to cut friction to a minimum. Grit and dust is prevented from entering the troughing idlers by closed upper ends and greased labyrinth. The return rollers are made of smooth finished seamless steel.

A full range of sizes is available.

● Reo Industrial Engines

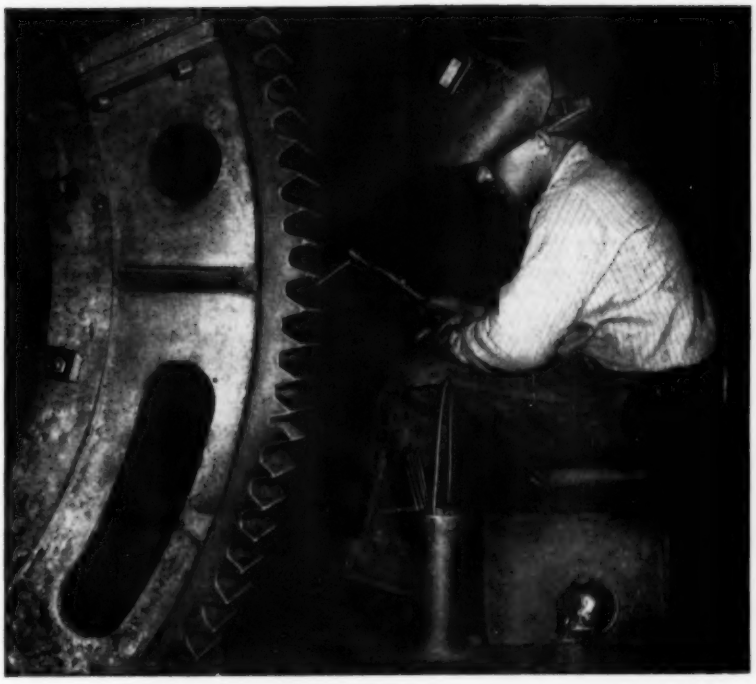
Entering the industrial engine field, *Reo Motors* recently introduced a line of 6-cylinder engines rated at 105, 120 and 240 hp. spark ignition models for use with gasoline, natural gas fuel, liquefied



petroleum gas or dual fuel carburetion. Reo's nation-wide distribution organization will sell and service the new units.

Replaceable wet cylinder sleeves, seven main bearings, full flow oil cooling and filtering, continuously-controlled by-pass cooling system, safe operation up to a 15° angle of inclination, top outlet exhaust manifold engineered to minimize and equalize back pressure on each cylinder, lifting eyes, standard SAE No. 3 flywheel housing and several other basic design characteristics are incorporated.

Optional and accessory equipment is available to tailor the engine to the needs of the job: variable speed governor, bases, power take-offs, visual alarms on the instrument panel, heavy-duty air cleaners, auxiliary compressors (illus.), etc.



YOU'LL SAVE TIME AND MONEY BY SPECIFYING

REXARC "30"

FOR YOUR NEXT GEAR REBUILDING JOB!

Rebuilding gears, sprockets, cast iron hubs and boxings are "naturals" for Rexarc "30". Here's an electrode metallurgically designed for producing a sound bond with the parent metal, free from porosity and cracks. Easy to apply in any position.

Deposits stand up exceptionally well under weight and angular shock. At red heat, the deposited metal can be forged into shape with a hammer in progressive steps. Practically no grinding needed.

Rexarc "30" can be applied to most steels and cast irons. In addition to its fine running qualities, there's a bonus in extra long wear.

HARD-FACING Rexarc ELECTRODES

SEE YOUR WELDING SUPPLY DISTRIBUTOR OR WRITE

THE SIGHT FEED GENERATOR COMPANY
61 EAST THIRD STREET
WEST ALEXANDRIA, OHIO, U. S. A.

trade notes

Southern Engine & Pump Co. has been appointed to distribute its diesel engines in 117 Texas counties and southern Louisiana, the *Nordberg Mfg. Co.* has announced. These diesels, in the 10 to 45 hp range, are offered as self-contained, ready to hookup units. C. A. Leavens, founder of the distributor organization in 1908, is still active in the business. D. N. Wommach is president, assisted by W. G. Price, S. R. Carrington and Richard Kropp. Southern Engine & Pump maintains offices in six Texas and Louisiana cities.

General Equipment, Inc. of Baton Rouge, has been named to sell *Bucyrus-Erie* shovels, draglines and cranes in the southern parishes of Louisiana, the South Milwaukee manufacturer has announced. Sales will be supported by complete replacement and repair service.

A new *Caterpillar Tractor Co.* factory for the production of motor graders and industrial wheel tractors is to be built soon, company officials have revealed. Although the location has not yet been determined, the plant will occupy 700,000 sq. ft. of manufacturing space, and will cost about $45-million. Its erection will permit the Peoria plant to broaden its program of crawler tractor and diesel engine manufacturer.

SAM E. GEWIN has been appointed district manager at St. Louis for the *Bristol Company*, Waterbury, Conn., manufacturers of recording and control instruments. With Bristol since 1937, he has been resident sales engineer at Buffalo the past five years.

GEWIN

MAYES

THORN L. MAYES has been appointed general manager for the newly-established Small Integral Motor Dept. in *General Electric's* Industrial Power Components Division. The new department will be responsible for standard and derivative lines of polyphase induction motors from 1 to 5 hp. This is the first step in transferring the small integral motor business from the motor and generator division, shifting manufacturing eventually to Fort Wayne, Ind.

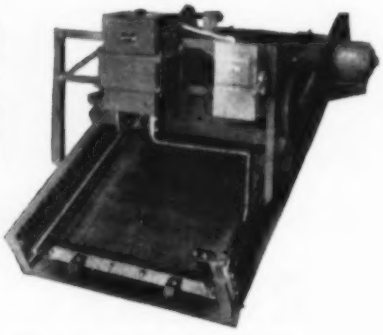
Others assigned to the new department are: L. DEAN FOWLER, manager of marketing; OSCAR L. WEITZMAN, manager of manufacturing and employee relations; J. HERBERT BEHM, manager of engineering, and MARTIN L. KRESOE, manager of finance.

W. A. HERPICH, chief production engineer for the *Galion Allsteel Body Co.*, Galion, Ohio, has been appointed manager of manufacturing, responsible for the firm's entire line of hydraulic hoists dump bodies and elevating end-gates.

Mack Motor Truck Corp. has opened a new factory branch at 13600 Broadway, Cleveland, Ohio.

J. H. MCMILLEN, formerly West Coast sales manager for the multiwall bag division of St. Regis Raper Co., has been named assistant sales manager for multiwall bags by the *Crown Zellerbach Corp.*, to handle sales of output of its Port Townsend, Wash. and San Leandro, Calif. plants.

HEATED SCREEN



The Leahy

Makes Fine Mesh Screening Easy

Really tough screening jobs . . . such as fine mesh screening of damp lime, ag-lime and silica sand . . . are made easy and profitable with the FlexElex equipped Leahy Screen. Look at the record:

- The Leahy is the original no-blind vibrating screen.
- Differential vibration, ***proved in the handling of difficult screening over two decades,*** clears the mesh of intermediate size wedging particles.
- FlexElex electric heating, introduced over two years ago, keeps the wires dry and the mesh wide open. Owners report complete amortization of cost in less than a year.
- No other heated screen can match this record of experience and performance in the field of fine mesh screening.

Send for complete information.

The DEISTER CONCENTRATOR COMPANY

The Original Deister Company, Inc. 1906

911 Glasgow Avenue, Fort Wayne, Indiana

The New Haven Vibrator Co., New Haven, Conn., has changed its name to *The Branford Co.*, and is now headed by Arthur H. Jones, formerly vice president of the Gray Mfg. Co.'s research development division. The firm has sold vibrators under the name Branford since its founding in 1915. Mr. Jones, who plans no change in policy, is a member of a well-known Hartford construction family. He serves as a consultant to the Defense Department's Research and Development Board. David E. Rausch, retiring general manager, will continue to advise the new management.

STEVEN P. J. WOOD has been elected president of the *Warner Electric Brake & Clutch Co.*, Beloit, Wis. He has served in several executive posts since joining the firm in 1945.

WOOD

BUSHONG

ROBERT BUSHONG has joined the *Wayne Crane Division* of American Steel Dredge Co. as chief engineer in a general expansion program. He has formerly served with Insley Mfg. Corp. and Marion Power Shovel Co.

W. H. Milroy & Co. and *Bacon-Green & Milroy* have established new offices in their own building at 29 Washington Ave., Hamden 14, New Haven, Conn.

Pekay Machine & Engineering Co., Chicago designers and manufacturers of elevator bucket conveyors, conveyors, sand handling and conditioning equipment and other devices, has acquired the entire production facilities of Pekay Metal Fabricators, to assure an integrated manufacturing setup.

Cleaver-Brooks Co. has appointed the *Hi-Way Equipment Co.*, Houston, Texas as distributors for its road machinery division, which makes asphalt plant equipment and concrete curing devices. W. P. Beerbower, president of Hi-Way, will supervise C-B service in 25 southeastern Texas counties.

PAUL CLANCEY and H. R. CAPERS JR. have joined the sales staff of *Chase Bag Co.* Mr. Clancey will cover eastern Washington, northern Idaho and western Montana from Spokane. Mr. Sapers will service accounts in the Dallas-Fort Worth area.

MINIER SARGENT, partner in a well-known Chicago law firm, has been named secretary of the *Caterpillar Tractor Co.*, assuming some of the duties formerly held by vice president William H. Franklin, who takes over director of the merchandise department.

WARREN A. BLOSSOM, a field engineer with 12 years service, has been named service manager by *St. Paul Hydraulic Hoist*, Minneapolis, Minn., manufacturer of hoists and dump bodies.

ELMER H. SHAFER has joined *Builders Structural Steel Corp.*, Cleveland, as manager of its steel warehouse division. Formerly with Joseph T. Ryerson & Sons, Mr. Shafer will guide the division's sales activities, freeing vice president R. F. Thompson for other duties.

ROBERT J. KING, of *Builders* sales staff, has been promoted to assistant manager of the warehouse division.

Page Sales Service, 407 S. Dearborn St., Chicago 5, has been named direct factory representative in the Chicago area for *Homer Manufacturing Co.*, Lima, Ohio.

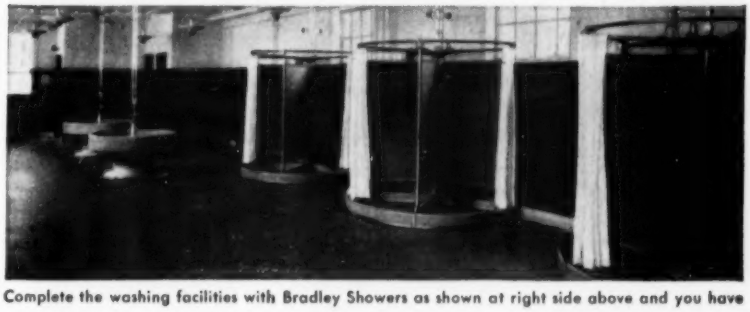
Holmes & Stone of Houston has been named by *Chicago Steel Foundry*, Chicago, Ill. to sell Pyrasteel and Evansteel castings in the state of Texas.

PAUL L. HERSHFIELD has been elected president of the *Walsh Refractories Corp.*, St. Louis, replacing J. L. Crawford who has resigned. Mr. Hershfield has been chairman of the Walsh board several years.

A. J. TOMASEK, chief engineer of *Walsh*, has been promoted to its executive vice presidency. JOHN J. DUGGAN is now sales manager for glass refractories, and W. K. SCHWEICKHARDT sales manager for general refractories.

With Bradleys like this, washing time is reduced. (Pre-Cast Stone Model)

And women as well as men enjoy the sanitary features. (Stainless Steel Model)



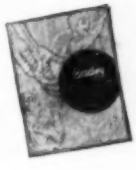
Complete the washing facilities with Bradley Showers as shown at right side above and you have

The Finest in Washroom Fixtures

American industry has found that Bradley Washfountains and Showers provide the maximum capacity while making savings in space, water consumption, piping connections and maintenance. With foot-control Bradley Washfountains eliminate faucets, so hands touch nothing but the clean running water while up to 10 are accommodated simultaneously. The bowls are self-flushing to prevent collection of contaminating water.

Multi-Stall Showers are furnished in 5- and 3-Stall Units — shipped partially assembled for quick installation.

During over 30 years Bradleys have become recognized as the finest and most sanitary washing fixtures available, -- an aid to better human relations. BRADLEY WASHFOUNTAIN CO., 2299 W. Michigan Street, Milwaukee 1, Wisconsin.



Complete Catalog 5204 mailed on request.

BRADLEY washfountains and showers

Distributed Through Plumbing Wholesalers

WOODROW W. WEST, a specialist in crushing and grinding, has been named sales representative for Eastern New York, Connecticut and Northern New Jersey, the *Williams Patent Crusher & Pulverizer Co.* of St. Louis has announced.

J. P. HOLT has been named to head a new sales office for *Basic Refractories* at St. Louis, the Cleveland firm has announced. His office will be at 20 So. Central Ave., Clayton 5, St. Louis.

CARL J. KOELSCH, director of purchases since 1951, has been elected a vice president of the *Fruehauf Trailer Co.*

WEST

HOLT

ELMER V. MROZEK and GERALD T. BAKER have been named sales promotion manager and production manager, respectively, for the *Lessman Mfg. Co.*, Des Moines. Mr. Mrozek was formerly sales manager for Badger Machine Co. Mr. Baker comes to Lessman from Horn Mfg. Co., where he was design and chief engineer. He is a partner in the Baker Mfg. Co., Neligh, Nebr., manufacturer of hydraulic control valves.

These appointments are in line with new policies established by David G. Neuman, president of United Steel Barrel Co., Philadelphia and Wilmington, which recently bought the Lessman firm. Every effort will be extended to establish the Lessman Loader as tops in the field of heavy-duty, hydraulically-operated units, Mr. Neuman says.

D. H. DENHOLM of the *Chase Bag Co.'s* industrial engineering department in St. Louis has been elected to Sigma Xi honor fraternity at Washington University, from which he holds a master's degree in industrial engineering.

L. J. MARRELL and J. E. FITZGERALD have been named field representatives for the *Alloy Rods Co.*, York, Pa. Mr. Marrell brings 20 years experience in the welding industry to Alloy Rods, and will serve the Midwest from Chicago. Mr. Fitzgerald was with Riverside Metals Co. before joining Alloy two years ago. He will serve the South.

MARRELL

FITZGERALD

CARL P. BROCKWAY has been elected president and director of *Asbestos Mfg. Co.*, Huntington, Ind. subsidiary of *Thermoid Co.* As vice president of the parent firm, he has been in charge of the Friction Division at the main plant in Trenton, N. J. Before joining Thermoid in 1941, Mr. Brockway was president and general manager of the World Bestos Corp.

A. K. (ED.) RUNKLE has been named superintendent of the *Thermoid Co.'s* Friction Division at Trenton, N. J. He has been 20 years with the firm.

E. C. CLARK has been named director of operations for the *Air Reduction Sales Co.*, New York. During his 24 years with Airco Mr. Clark has held several top posts, including the superintendency at Houston and Louisville.

L. B. DOBBINS, works manager at *Airco's* Butler, Pa. plant, has been advanced to manager of plant engineering in New York City. R. E. LENHARD, whom Dobbins replaces, has become vice president for manufacturing at Airco's Ohio Chemical & Surgical Equipment division, Madison, Wis.

ROBERT H. MCCORMICK has joined the *Master Vibrator Co.* of Dayton and Miamisburg, Ohio, as sales manager.

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For Original Equipment or Replacement Applications

"STANDARD" manufactures a complete line of elevating and conveying buckets, idler rolls, slatted pulleys, casing, bin gates and special steel weldments to specification.

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CONTINUOUS OR SALEM TYPE BUCKETS

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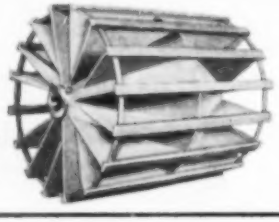

SLATTED PULLEYS

BRUCE HERBERT has been shifted from the industrial distributor sales department of *Rollway Bearing Co.*, Syracuse, N. Y., to open a direct factory representative's office at 647 W. Virginia St., Milwaukee 4, from which to serve Minnesota and Wisconsin.

RALPH RAMER has been appointed assistant to the Chicago district manager of *Wickwire Spencer Steel Division*, the Colorado Fuel & Iron Corp. has announced.

FRANCIS B. SPEAKER has resigned as director of the Mining Requirements Division of the Defense Materials Procurement Agency and has returned to his duties with *Hewitt-Robins, Inc.*, Stamford, Conn., which loaned him to the government at the outbreak of the Korean war.

HARVEY V. EASTLING and DONALD E. THAL of the *Link-Belt Company's* Pacific division have been promoted: Mr. East-

EASTLINE

THAL

ling advancing from general sales manager to assistant general manager of the division; and Mr. Thal moving up from assistant sales manager to Mr. Eastling's old post.

CHESTER M. BOEHM has been named manager of sales policy for the mechanical goods division of the *United States Rubber Co.* He has been assistant manager for the sales operating department.

FRANK W. RICKARD has been appointed to the newly-created post of director of manufacturing services by the *Borg-Warner Corp.*, Chicago. He has been general superintendent at Chrysler's tank engine plant in New Orleans, and was previously with Continental Motors for several years.

ARTHUR L. ROSS, assistant general manager for the Southern Kraft Division, has been elected a vice president of the *International Paper Co.* A veteran paper man, Mr. Ross joined International when it absorbed the Bastrop Mill in Louisiana some years ago.

GEORGE L. ANDERSON has been named assistant to the general purchasing agent of the *American Brake Shoe Co.* He will handle the purchasing of foundry supplies, coke and ferro-alloy and petroleum materials.

JAMES A. ROSS, who has served the firm 30 years, has been elevated to the chairmanship of the board by *Sprague & Henwod*, well-known diamond core drilling contractors and manufacturers of Scranton, Pa. ADRIAN E. ROSS has been advanced to the presidency, and WILLIAM J. SCHANK has been made senior vice president and general manager.

CHRISTY

LARKIN

Christy Equipment Co. of Omaha has been named distributor for *Clark Equipment Co.* fork lift trucks, powered hand trucks and towing tractors in the region that incorporates parts of Iowa, Nebraska, Minnesota and all South Dakota. GORDON K. CHRISTY, a Clark salesman for 8 years, and C. O. CHRISTY head the dealership.

KENNETH B. LARKIN has been appointed district sales representative for the Pacific Northwest and three Canadian provinces by the *Frank G. Hough Co.* Formerly with Nelson Equipment Co., Mr. Larkin succeeds H. E. Thomas who has taken over the Midwest territory for Hough.

WILLIAM O. WILSON, commercial vice-president of *Worthington Corporation*, announced his retirement April 30, after 53 years service with Worthington and its predecessor companies.

Control YOUR CONVEYOR PRODUCTION with Transportometer®

CONTINUOUS WEIGHING

No more estimating tonnage figures or rehandling material for weighing. Installed on your present belt conveyor system, TRANSPORTOMETER can automatically and accurately weigh, regulate, totalize and record the flow of raw, intermediate or finished products. Whether it is storing, handling or processing, you get a more complete and precise control of your operations with resultant savings in material, time and labor.

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4—*Easily installed*—Unit supplied ready for mounting on new or existing belt conveyor, without removing or changing conveyor structure, at any conveyor inclination.
5—*Low maintenance cost*—Negligible wear because of Transportometer design . . . and the lowest maintenance cost of any comparable equipment.

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Flour	Soap Powders	Ores	Chemicals	Sulphur
	Super Phosphate	Sand and Stone	Coffee Beans	Vegetables
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SINTERING MACHINERY CORPORATION
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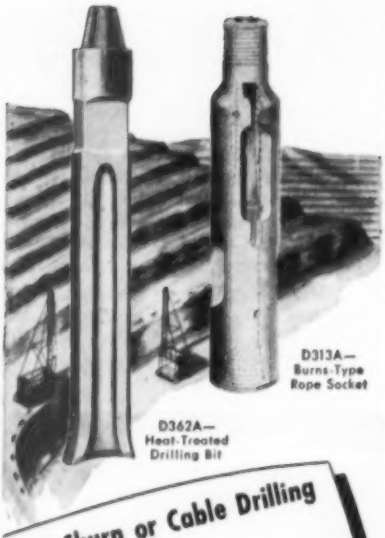

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SAFE • EFFICIENT • ECONOMICAL

Spang Churn or Cable Tools are top performers in their fields for drilling test holes when prospecting or sampling . . . drilling blast holes for fragmentation of minerals or overburden . . . drilling and reaming escape, dewatering and ventilating holes . . . and drilling wells for other purposes. Fifty years' experience serving oil, water-well, mining and quarrying operations assures their value.

LARGE BITS for pilot hole drilling and stage enlargement reaming of dewatering, ventilation and escape holes.

D370F—Prefabricated Star Bit

Barber-Greene's new field engineer staff: front (L-R): James Rice, W. H. Brott, Kent Shell and Richard Graffagna; rear: Richard Jouannet, Edward Curtin, Ralph Andreasen, Robert Hoppenrath.

G. L. PERKINS and ROBERT L. TINGLEY have joined the sales force of *Arkell & Smiths*, paper bag makers. Mr. Perkins will serve in the Western division, at Minneapolis; Mr. Tingley in the central division, out of Columbus, Ohio.

Tractors, Inc. has been named distributor for Rhode Island and southeastern Massachusetts by the *Marion Power Shovel Co.*, Marion, Ohio. Located in Providence, the firm is headed by John H. Gorman, with J. B. Gorman and Charles L. Woolley as officers.

The Transportometer Division of the *Sintering Machinery Corp.*, Netcong, N. J., has appointed three distributors for its line of continuous weighing equipment: *Tate & Roe Co.*, Dallas, Texas, to serve Texas, Oklahoma and northwest Louisiana; *Lake Shore Engineering Co.'s* Supply Division, Iron Mountain, Mich., to serve the iron ranges of Minnesota, and Wisconsin and Michigan's upper peninsula; and *Galigher Co.*, Salt Lake City, to serve Utah and nearby Nevada, Idaho, Montana and Wyoming.

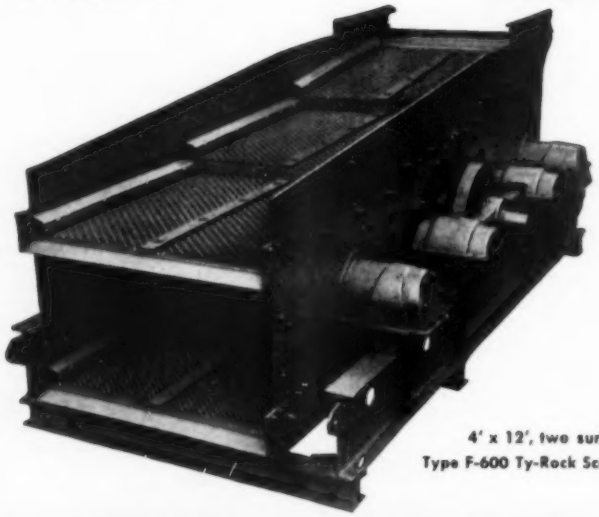
Union Bag & Paper Corp. has established a new Western sales office in the Victor Building, Kansas City, Mo. B. J. O'Hearn, southwestern district manager for multiwall bag sales, and W. H. Burget, sales representative, will make it their headquarters.

Eddy & Co. of Lansing, Mich., has been appointed distributor for crushing, screening and conveying machinery made by the *Lippmann Engineering Works*, Milwaukee, covering all Michigan except the upper peninsula.

YOU CAN DEPEND ON

TY-ROCK SCREENS

BALANCED **RUGGED**



4' x 12', two surface
Type F-600 Ty-Rock Screen

THE W. S. TYLER COMPANY
CLEVELAND 14, OHIO
Manufacturers of Woven Wire Screens and Screening Machinery

COLVILLE

FORSTER

KENNETH H. COLVILLE JR., a great-grandson of the founder of the *Hendrick Mfg. Co.*, has been elected secretary of the firm and a member of the board. He has been associated with Hendrick since 1940.

ALBERT E. FORSTER has succeeded Charles A. Higgins as president of *Hercules Powder Co.* A director since 1940, he has been on the executive committee since 1951. Mr. Higgins remains chairman of the board.

Appointment of *King-Knight Company*, San Francisco, Calif., as distributor for Nordberg diesel engines in central and northern California was announced by *Nordberg Manufacturing Co.*

JOHN D. WILLIAMS has been elected vice-president and general manager of *Rollway Bearing Co., Inc.*, succeeding William B. Smithers, who resigned recently. Mr. Williams also holds the same position in the parent Lipe-Rollway Corp.

Walton Equipment Co. of New York City has been named to handle sales of *Lippmann Engineering Works* machinery in the New York area and New Jersey.

Werco Steel Co. of Chicago has been appointed to serve as direct factory representative in the Midwest for *Cross Engineering Co.*, Carbondale, Pa.

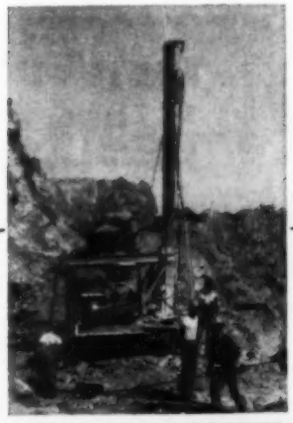
The Foxboro Co., Foxboro, Mass., has organized a Mexican affiliate, *Graficas e Instrumentos, S.A.* at Mexico City, to manufacture its measurement and control instrumentation for sale by the firm's Mexican representatives *Schultz y Cia.*

Hobart Bros., electrode manufacturers, have built a new $3-million electrode plant at Troy, Ohio.

Thor Power Tool Co., Aurora, Ill., has opened a new sales and service factory branch office at Newark, N. J., to serve the Northern New Jersey area.

PAUL A. ROUSCH, senior project engineer at *Flexible Tubing Corporation*, Guilford, Conn., has been named manager—product development of the company. A physicist and specialist in high temperature polymers, Mr. Rousch will have charge of Flexible's research, product development, and quality control activities.

RAYMOND C. JENNESS and ALVIN H. MATTNER have been named assistant engineers in *Allis-Chalmers* processing machinery department, and WILLIAM D. GRABOW has been assigned to the Duluth branch office.



Detachable, 4-inch, carbide Rok-Bit. Other Rok-Bits from 1¼" up—cross or chisel types.

Abrasive rhyolite no problem— with ROK-BITS

You're ready for anything when you put this blast hole drilling team to work—detachable, carbide Rok-Bits® and Brunner & Lay Drill Steel. Here exceptionally abrasive rhyolite is being drilled with 4-inch, 4-point Rok-Bits. Speeds up to 12.8 fph have been obtained. You, too, can cut your drilling costs, up your output, using Rok-Bits. Write for booklet—"Guide to Better Footage, Lower Drilling Costs."

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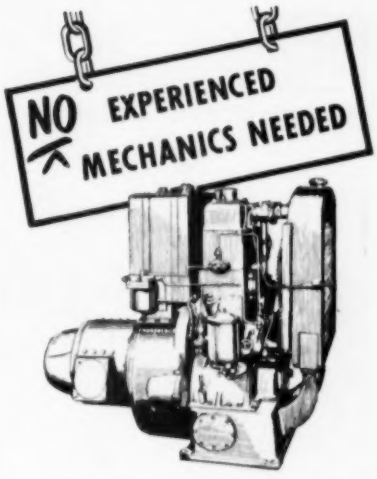

. . . NORDBERG DIESEL ENGINES are easy to operate— simple to maintain

You just don't need special mechanical training to operate and maintain Nordberg "4FS" Diesel engines.

Their basic design and construction makes them easy to start and easy to keep going—day in, day out, with a minimum of attention. Routine maintenance is extremely simple . . . all parts are easy to get at.

These are reasons why Nordberg 1, 2 and 3-cylinder "4FS" Diesels are more and more in demand for all kinds of power jobs from 10 to 45 hp—for electric service from 6 to 30 kw (6,000 to 30,000 watts)—and for pumping jobs from 200 to 3000 gpm at 15 to 240 ft. total head.

Mail the coupon for full details.

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Send catalog covering Nordberg Type 4FS Diesels. I am interested in a unit for the following service: PO

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MODERN QUARRY OPERATORS

"Cape Ann"
FORGED
STEEL DROP BALL

RUGGED DESIGN
GREATER IMPACT
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The "Cape Ann" Drop Ball is a sure winner because it provides top serviceability at minimum cost.

Strong alloy steel pin. Forged connecting link, protected by deep recess, adaptable for swivel or shackle. Minimum cable replacements. Furnished complete as shown.

2000 to 8000 lbs.

Write for full details

Cape Ann Anchor & Forge Co.
Gloucester • Massachusetts

R. G. LeTourneau, Inc., has moved its headquarters from Peoria, Il. to Longview, Tex.

J. A. HILL, a member of the firm for 33 years, has been named vice president and sales manager of *Thor Power Tool Co.* JOHN A. MCGUIRE, chairman of the executive committee, is now vice president for labor relations as well. B. H. JOHNS, sales manager for the contracting and mining division, is now vice president for rock drill sales. W. B. HUNN is vice president for the Los Angeles works.

Bemis Bro. Bag Co. has discontinued the manufacturing of textile bags at Jacksonville, Fla., and will serve its market in that region through increased production at New Orleans and Memphis and from its multiwall paper bag plant at Mobile.

Motorola has set up a regional parts depot at Dallas to serve its 2-way radio users in Texas, New Mexico, Arkansas, Oklahoma and Louisiana. The southwest regional sales office will share space with the parts depot in a new building in the Trinity industrial district.

HARALD T. REISHUS, general manager of *International Harvester's* Industrial Power Division since it was formed in 1944, has been named vice president in charge of the division.

E. J. HARTLEIN succeeds Jack Miller as *Koehring Co.* central-northwest representative, covering Minnesota, the Dakotas, Nebraska, Iowa and Kansas.

The *Bucyrus-Erie Co.* and *the International Harvester Co.* have concluded an arrangement under which B-E industrial tractor equipment will be sold, distributed and serviced by I-H to its industrial power distributors, and will eventually be manufactured by Harvester.

For many years Bucyrus-Erie has been an important manufacturer of allied equipment for I-H industrial tractors, selling directly to the Harvester outlets. Because its facilities are needed for the expansion of other lines, B-E has decided to withdraw gradually from the manufacture of the I-H items while I-H undertakes their manufacture, a move that will take some years to culminate.

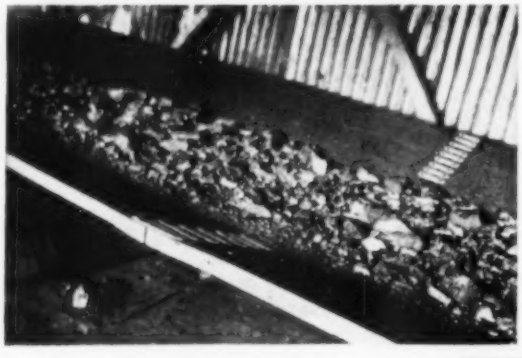
The new arrangement is Harvester's first move to supply a line of allied equipment to its distributors.

A new line of aggregate screens and industrial wire cloth is being offered by the newly-organized *Hoyt Wire Cloth Co.* of Lancaster, Pa. The firm, which purchased its machinery from John A. Roebling's Sons, Trenton and installed it in a new 27,000 sq. ft. building in Lancaster, is headed by two former Roebling men: F. G. HOYT, president and WILLIAM HOBBS JR., vice president and sales manager. Each has over 18 years experience in the wire and wire cloth industry.

Supertough Abraso, made from premium grade oil-tempered wire, and Abraso, made from hard drawn high carbon steel wire, are the firm's primary products. Both are available in square, oblong and slotted openings.

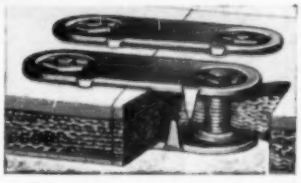
FLEXCO®

BELT FASTENERS and RIP PLATES



FOR HEAVY CONVEYOR AND ELEVATOR BELTS OF ANY WIDTH

★ FLEXCO Fasteners make tight butt joints of great strength and durability.
★ Trough naturally, operate smoothly through take-up pulleys.
★ Distribute pull or tension uniformly.
★ Made of Steel, Monel, Stainless, Everdur. Also Promal top plates.
★ FLEXCO Rip Plates are for bridging soft spots and FLEXCO Fasteners for patching or joining clean straight rips.

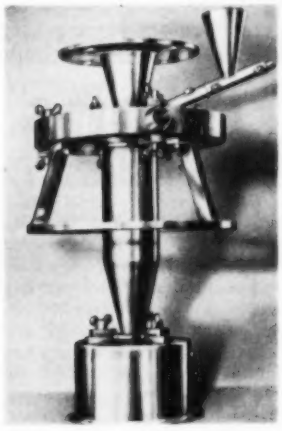


Compression Grip distributes strain over whole plate area

Order From Your Supply House. Ask for Bulletin F-100

FLEXIBLE STEEL LACING CO., 4623 Lexington St., Chicago 44, Ill.

All interests for the *Micronizer* pulverizer have been acquired by the *Sturtevant Mill Co.* of Boston from the Micronizer Co., Moorestown, N. J. A jet pulverizer for reducing solids into micron ranges, it has many applications in the non-metallic metals industries.



The Ray C. Call Co. of South Charleston, has been named West Virginia distributor for equipment manufactured by the *Koehring Co.* and its subsidiaries: *Parsons Co., C. S. Johnson Co.* and *Kwik-Mix Co.*

Sterling Electric Motors has appointed the following distributors for its electric power drives: *R. R. Liggett,* Prescott, Ariz.; *Whitfield Electric Co.,* Madisonville, Ky.; *Phillips & Co.,* Columbia, Ohio; *Henry A. Petter Supply Co.,* Paducah, Ky.; *W. A. Tydeman & Son,* Easton, Pa.; *Pensacola Mill Supply Co.,* Pensacola, Fla.; *P&H Electric Motor Works,* Watsonville, Calif.; and *L. J. Hand, Inc.,* New York City.

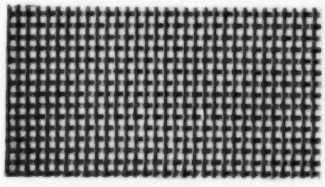
Materials Handling Products Corp., Syracuse, N. Y., recently named distributor for *Yale* industrial trucks, is headed by PAUL R. MINICH JR. and has branches at Schenectady and Utica.

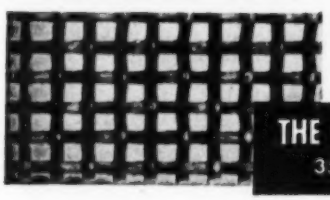
JOHN J. MCCLOY, former U. S. High Commissioner for Germany, has been elected to the board of directors of *Westinghouse Electric Corp.,* succeeding Winthrop W. Aldrich.

Industrial engines are now being made by *Reo Motors,* Lansing, Mich. for use with gasoline, natural gas fuel, L.P.G. or dual fuel carburetion. Three basic units, 105, 120 and 240 hp, will be sold through a newly-established industrial engine sales organization headed by R. D. JACOBS. Reo's nation-wide distributor organization will service the new line.

Quaker Rubber Corp. has established a warehouse and sales office at New Orleans to serve southern Louisiana. MORGAN KATHER is branch supervisor.

AROUND THE CLOCK
EVERYDAY—WITHOUT SHUTDOWNS
CLEVELAND WIRE SCREENS





Everyday—around the clock... less down time... increased tonnage... greater production can be yours when you install longer life "Cleveland" Wire Screens. Tough—yet ductile, produced by craftsmen, "Cleveland" wire screen sections maintain rigid accuracy of openings, have fewer wire breaks, prove greater resistance to abrasion, corrosion and fatigue. Mail us your requirements—our specialists will make recommendations at once.

Write for Bulletin No. 5 and 6.

THE CLEVELAND WIRE CLOTH & MFG. CO.
3574 E. 79 STREET · CLEVELAND 5, OHIO

Removing a four-foot core from the corebarrel of a Sprague & Henwood contract drilling rig at an iron ore property in Northern New York.

Good Cores
from ANY formation

The efficient organization and equipment developed during more than sixty years of successful world-wide experience in contract diamond drilling enable us to obtain a high percentage of core from any rock or ore formation. Unfavorable conditions are overcome, in many cases, through the use of special tools developed by our own engineers and manufactured in our own extensive shops.

Besides all types of exploratory drilling for coal and ore, our service includes foundation testing and pressure grouting. Experienced crews and supervisors are available for service anywhere in the United States and most foreign countries. Estimates submitted on request.

The same high-speed drilling machines, improved diamond bits and complete accessory equipment used by our own crews are available to other diamond drill operators. Write for Bulletin 320 and tell us about your operating conditions. Our experienced executives welcome opportunities to make money-saving suggestions.

Sprague & Henwood, Inc.
SCRANTON 2, PA.

See our 4 page insert in McGraw-Hill Mining Catalogs

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says McCULLOCH MOTORS CORP.
Makers of the famous McCulloch Chain Saws

"We tested all types and makes of lubricants for the Zerol gears in the transmission. The one grease selected for long, tough operation was LUBRIPLATE. Now that we have produced thousands of McCulloch Chain Saws, we more than ever recommend the use of LUBRIPLATE Lubricants in our tools."

For nearest LUBRIPLATE distributor, see Classified Telephone Directory. Send for free 56-page "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

Legal decisions

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

Validity of Bond

A contractor asked this important legal question: "Can a materialman always recover payment from a bonding company for materials and labor supplied the general contractor?"

According to a late higher court decision, a materialman is not entitled to recover payment from a bonding company for materials furnished to a contractor, unless the contract or bond clearly states that the bond is given for the benefit of the materialman.

For instance, in *K. R. Co. v. Fidelity & Casualty Co.*, 37 F. (2d) 279, a higher United States Court held that a materials man had no right of action against a surety on a bond which indemnifies a city against a breach of contract, since the bond and contract were intended to protect the city only.

The facts of this case are that a contractor who had entered into a construction contract with a city furnished a bond containing the following clause:

"The bonding company shall keep and save the obligee (city) harmless and indemnify it from and against any and all claims of every description incurred or growing out of the prosecution or construction of said work according to the terms of said contract. . . ."

A company furnished to the contractor a considerable quantity of asphalt for use in carrying out the contract. The contractor failed to pay for the materials, and the company filed suit to collect the amount from the bonding company. The court held the latter not liable, and said:

"The meaning of the contract is plain and in such case the surety, even though it be a bonding company for profit, is entitled to have it interpreted according to ordinary principles. . . . The bond and contract, read together, were for the protection of the obligee, the city. . . . Plaintiff (company) was neither a party to the bond and contract nor mentioned therein. The case is controlled, therefore, by the common law rule that no one can maintain an action in his own name upon a contract to which he is not a party."

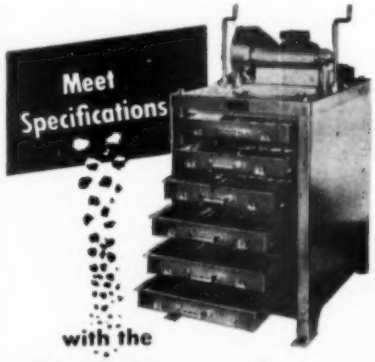
Tenant Orders Work

A reader asked this question: "I should like to know whether I can have a mechanic's lien on real property on which I did concrete repair work ordered by a tenant. Both the tenant and landlord have refused to pay me, although I increased the value of the property by several hundred dollars. The landlord knew that I was doing this work, and I contend he should . . . pay me."

The law is well established that one who furnishes material to a tenant for the improvement of real estate, and has no contractual relation with the landlord, is not entitled to a materialman's lien.

For instance, in *Stevens Supply Co. v. Stamm*, 152 S. E. 602, a tenant who had possession of property under a lease contracted to improve it. The contractor purchased materials, and later the materialman filed a mechanic's lien against the property. In holding the lien invalid, the Court said:

"A tenant cannot order work done upon the demised premises and charge the owner with the cost, unless there is some relation existing between him and his landlord other than that of lessor



with the

Gilson Testing Screen

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BOX 186 · MERCER, PENNA.

and lessee, by virtue of which the landlord expressly or impliedly consents to the contract under which the improvements are made. The mere knowledge of the landlord that the improvements are being made by the tenant is insufficient to charge him or his premises with their cost. He must either expressly or impliedly authorize the tenant to make the improvements for the former's benefit."

Satisfied Claim

A reader asked this question: "If a contractor accepts "extra payment" for work and this payment is insufficient, can he later sue and recover the full amount due if he proves that he was under a fear when he accepted the settlement?"

A contract made under duress is void. The term "duress" is any imposition, oppression, or the taking of undue advantage of the business or financial stress or extreme necessities or weakness of another. However, the mere fact that a contractor accepts final and extra payment under fear is not sufficient testimony to establish "duress".

For illustration, in *Norton v. Michigan State Highway Department*, 24 N. W. (2d) 132, it was shown that a contractor was awarded by a state a public construction contract which called for removal of 70,000 cu. yd. of material. He was compelled to perform extra work because he moved the 70,000 yards which he bid on, and the total yardage was increased to 241,000. The contractor submitted a claim for $27,000 extra payment which was paid to him. Later he filed suit for an additional $30,900, alleging that the state refused to pay him a fair and reasonable profit for his services although it did pay the extra payment of $27,000.

The contractor testified that when he accepted the additional $27,000, he did so because he "figured that to get $27,000 was better than nothing", and that he accepted the $27,000 under "duress and compulsion", fearing that he would get no payment if he refused this amount. The higher court refused to hold that the state must pay the contractor more money, and said:

"In executing the release plaintiff (contractor) did so with full knowledge that the payment he then received was in full satisfaction of his claims arising out of the construction job here under consideration."

How to Avoid Legal Pitfalls

Reviews of several new higher court decisions are briefly explained in this department. They may be advantageously used by readers and their lawyers to win favorable verdicts in unavoidable legal controversies. Readers who desire to read any complete decision may do so in any good library by referring to the specific citation.

Allotment of Funds

It is well known that a seller of nonmetallic mineral materials to a state, county, or city cannot collect payment if the public official who made the contract had no lawful authority. However, with respect to "ear-marked" funds, a higher court decided last month that the seller always may collect payment for nonmetallic mineral materials sold to a state, county, or city.

For example, in *State Highway Department v. Dawson*, 253 Pac. (2d) 593, it was shown that a state law provides that the state engineer shall have the power to "acquire by purchase or condemnation stone or gravel beds and any other material suitable for highway construction." Also, certain money had been set aside or "ear-marked" for the purchase of gravel for the construction of a highway.

The owner of certain lands made a contract to sell gravel to the state highway department for the construction of the highway. Later payment for the gravel was refused. However, the testimony proved that the gravel had been used by the highway department in constructing the highway and also that the contract was signed by certain authorized public officials. Therefore, the higher court held that the state highway department must pay the bill, and said:

"Here, defendant highway department elected to acquire the gravel involved by purchase and in doing so, it cannot hide behind the cloak of state immunity to avoid payment therefor. Ordinary business honesty insists that a state, or any of its departments or agents, cannot be allowed to receive the benefits from an agreement and then repudiate the transaction without restoration of the property taken, or its agreed price, or the reasonable value thereof. The money has been appropriated; it has been allocated; it has been set aside, 'ear-marked', and placed in the 'kitty' for each project before contracts are let."

Must Pay Sales Tax

A legal question of considerable importance is the following: "If a seller of nonmetallic mineral materials neglects to include in a purchaser's invoices or bills the amount due the state for sales tax, can the seller later sue the purchaser and recover this amount?" Here is another question: "Can a purchaser offset a tax claim of this nature by claiming damages for the seller's breach of the sale contract?"

According to a late higher court decision, the answer to both questions is yes.

For example, in *Selected Investments Corporation v. International Trading Syndicate*, 251 Pac. (2d) 502, it was shown that for many months a seller of supplies overlooked including the 2 percent sales tax on the invoices mailed to the purchaser. Therefore, the purchaser did not pay the sales tax. Merchandise to the amount of $72,451.27 was purchased by the purchaser from the seller. Thus, the purchaser owed the seller $1,449.02 back taxes, because the seller was obligated to pay this amount to the state.

After expiration of nearly three years the seller sued the purchaser for this amount, although it was admitted that the purchaser would have paid the sales tax when it became due if the seller had not neglected to include the sales tax in the purchaser's invoices.

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The higher court held the purchaser liable for payment of the back taxes. Then the purchaser filed a counter suit for damages for a breach of the seller's warranty.

The higher court held that the purchaser could maintain this counterclaim to offset the amount owed the seller for delinquent sales taxes. The court said:

"The omission of the seller to include this tax in the invoice would seem to be almost identical with a situation where the seller omitted to include one of the items of merchandise in the billing."

For comparison, see *Watson v. American Creosote Works*, 84 P. (2d) 431. Here the court held that a counterclaim, whatever its nature, might be maintained by the purchaser if it arose out of or was connected with the cause of action of the seller.

Therefore, these new higher court decisions clearly hold that when a seller sues a purchaser for money due and involving a sale contract, the purchaser may combine in the same suit his claim for money due as an incidental, remote, or other cause connected with the original suit filed by the seller against the purchaser. In other words, the purchaser is not required to file a separate suit for the amount due from the seller, but both questions of law may be submitted to the court in a single action or suit.

User Is Liable For Payment

A few days ago a reader asked this legal question: "Can a property owner who comes into possession of merchandise without any fraud, unlawful design, or other effort on his part be compelled to pay for the merchandise?"

Such a situation may arise, for example, when a purchaser purchases merchandise which is delivered to the property owner and afterward another person gets possession of the merchandise and uses it without knowledge of the owner of the property on which the merchandise is stored.

In this case the higher court rendered an unusually important decision holding that (1) a tenant who installs equipment or uses materials in a house, without authority of the house owner, is personally liable for payment of the fixtures or materials although he did not purchase same; (2) and the house owner is not liable for payment.

For example, in *Wagner v. Blanken*, 250 Pac. (2d) 464, the testimony showed these facts: A person named Wagner purchased a home from one Blanken and made a down payment of $600, with a mortgage for the balance of the purchase price. After the purchase of the house Wagner bought on credit certain materials and accessories. Before these articles were installed, he discovered that he was unable to complete the purchase of the house, and moved out. He had not paid for the materials. Later a tenant named Edwards moved into the house and installed the accessories and used the materials. The seller sued to recover the purchase price.

As to Blanken, the owner of the house, the higher court held, that since Blanken had not purchased the equipment or materials and had not ordered his tenant to install them in the home, Blanken could not in any event be held liable for payment. The court said:

"There is no doubt that Edwards converted this equipment by installing it in the house owned by Blanken in which Edwards was living. There is nothing to show that Blanken agreed to this or authorized it in any way. Certainly Edwards could not force a sale on Blanken by attaching it to Blanken's house."

As to the tenant Edwards, the higher court held that he would be liable for payment, and said:

"In this case there is no question but that Edwards converted these fixtures wrongfully to his own use and benefit. True, it was not his property to which the fixtures were attached; but he was a tenant in the house and enjoyed the use of the fixtures so long as he was a tenant therein."

Therefore, in this case the higher court rendered an important decision, in effect, that a property owner who benefits from the use of purchased merchandise cannot be compelled to pay for it, if the testimony shows that he did not purchase the merchandise and did not authorize the particular use of the merchandise from which he benefitted. This law is broadly applicable to all property owners and purchasers, irrespective of the beneficial uses of the merchandise.

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traffic news

CENTRAL TERRITORY RAILROADS
Freight Traffic Committee

Docket 89609 (2)—Proposed to establish on stone, crushed stone screenings, in bulk; Tailings, in bulk, in open-top cars, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Delphi, Ind., to Bunker Hill (Naval Air Station), Ind., 107 cents net ton.

Docket 89610 (2)—Proposed to establish on crushed stone, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Monon, Ind., to Ada, Mich., 219 cents net ton.

GENERAL FREIGHT TRAFFIC COMMITTEE
Eastern Railroads

Bulletin G-7946 (Shipper)—Proposed to establish on limestone, natural, ground or pulverized, minimum carload weight 30 tons, from Marble Cliff, Ohio, to Strongheart and Carbon Glow, Ky., $3.59 per net ton, in open cars and $4.08 per net ton in closed cars, subject to ExParte 175-B increase.

Bulletin G-7961 (Carrier)—Proposed to establish on limestone, natural, ground or pulverized, unburned, minimum weight 30 tons, from Greencastle, Ind., to Springfield, Ky., $3.56 per net ton in closed cars, $2.86 per net ton in open cars, subject to ExParte 175-B increase.

ILLINOIS FREIGHT ASSOCIATION

Docket IRC 511-1253 (MRP6578)—Stone, crushed, carload, minimum weight 90 percent of marked capacity of car, except that when weight of shipment loaded to full cubical or visible capacity of car is less than 90 percent of marked capacity, actual weight will apply, but in no case shall the minimum weight be less than 20 tons, from Waterloo, Wis., to Chicago, Ill., and points in the Chicago district.

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Rates subject to X-175-B increase.

Docket IRC 511-1257—Proposed to establish on limestone, natural, ground or pulverized, unburned, carload, minimum weight 30 tons, from Valmeyer, Ill., to Huron, Ohio, 431 cents per net ton in open-top cars not protected by tarpaulin or other protective coverings; 481 cents per net ton in closed cars or in open-top cars protected by tarpaulin or other protective coverings.

WESTERN TRUNK LINE COMMITTEE

Docket X-E-41-1783 (S)—Proposed to establish on sand and/or gravel, carload, as described in item 440 Western Trunk Line tariff 160-R, minimum weight as shown therein. From Muscatine, Iowa, to Davenport and Bettendorf, Iowa, 65 cents per net ton; applies only on Iowa Intrastate Traffic. Not subject to ExParte 175-B.

NORTH PACIFIC COAST FREIGHT BUREAU

Docket NC 2889 (S) (Reopened)—Request for reduction in rate on lime, carload, Evans, Wash., to points in Idaho, Oregon, and Washington.

Docket NC 2982 (S) (Reopened)—Gypsum rock, broken, crushed or ground, carload, Heath or Hanover, Mont., to Yakima or Sunnyside, Wash., 23 cents per hundredweight, subject to X-162-6-8-175; minimum 40 tons.

NORTH PACIFIC COAST FREIGHT BUREAU AND PACIFIC SOUTHCOAST FREIGHT BUREAU

Docket JT-2521-(S)—Proposed to request rate of 23 cents on gypsum, ground, carload, Gerlach, Nev., and Sigurd, Utah, to Sunnyside and Yakima, Wash., subject to X-162-6-8 and 175; minimum 40 tons.

PACIFIC SOUTHCOAST FREIGHT BUREAU

Docket 3434 (S) (Reopened)—Request rate of 35 cents per hundredweight on rock, perlite, crude, carload, Superior, Ariz., to San Francisco, Calif.; minimum 50 tons.

Docket X 3658 (S)—Proposed to request rate on stone, namely, lava or volcanic, broken or crushed, in bulk, in open cars, carload, Sykes, to LaMetro, Calif., 15 cents per hundredweight, minimum 40 tons.

Docket X 3704 (S)—Proposed to request rate of 22 cents per hundredweight on rock, lime, carload, Davenport, Calif., to Fallon, Nev.; minimum weight 50 tons.

WEEKLY DOCKET AND STATUS REPORT
Prior Southern Freight Association Proposals

Docket A 14163 (c)—Proposed to establish two-factor rate on limestone, ground or pulverized, not burned, carload, Tate and Cartersville, Ga., to Edgeworth, Mass., namely, 195 cents plus 540 cents, and to Winthrop, Maine, 195 cents plus 620. Rates per net ton.

Docket A 14191 (c)—Proposed to establish on slag, carload, minimum weight as per item 180-C Southwestern Lines 162-T; carload, Mt. Pleasant, Tenn., to Joplin, Mo., 404 cents; Sand Springs, Tulsa, Okla., 416 cents; and Temple, Tex. 476 cents net ton, not subject to X-162-6-8.

Docket A 9745 (ERR (S) SFA-6492—Proposed to establish on limestone, ground or pulverized, carload, to Springfield, Ky., from Bedford, 243 cents net ton in open cars, and 293 cents in closed cars; Bloomington, Ind., 262 cents in open cars, and 311 cents in closed cars.

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July, 1953

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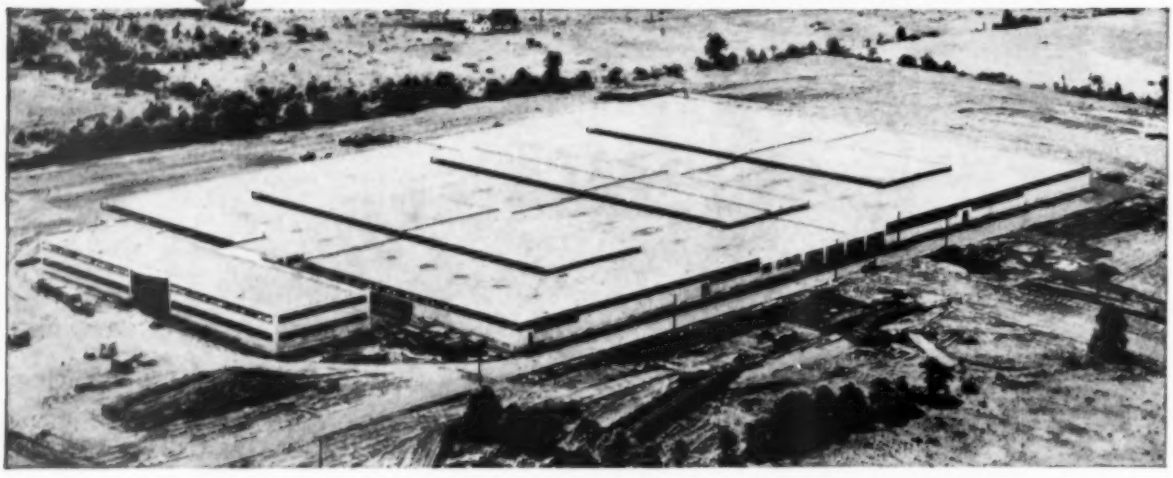

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LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 18 MODERN MILLS, 129,000,000 SACKS ANNUAL CAPACITY

The CONCRETE MANUFACTURER

July 1953

Let's Go!

BY THE TIME this issue has been mailed, the Board of Directors of the National Concrete Masonry Association will have decided whether or not to embark upon the broad program of promotion which has been under consideration since the industry meeting in Cleveland last winter. Thus it would appear that nothing we as a publication can say or do will in any way influence the outcome of the Board's deliberations.

What we say here and now must, therefore, be based upon the calm assumption that the block industry's acknowledged, elected leaders cannot possibly fail to adopt measures which have already been postponed much too long. The proposed program is intelligently conceived and admirably comprehensive, and the goals it sets strike us as being entirely achievable and well within the capacity of a strong, ably-staffed trade association. We feel quite confident that the Board will give the project a green light, and these remarks are therefore directed to the members who must provide funds for the job.

The Promotion Committee estimates that the proposed program will cost approximately $90,000 over and above the present amount budgeted for merchandising. We're just guessing now, but let's say the present budget allowance for promotional purposes is $20,000. On this assumption, the total program would cost around $110,000, or a little under 6¼ cents for every *thousand* 8-in. equivalent masonry units produced and marketed last year. Based upon an average selling price of 20 cents per unit, this would mean that about three one-hundredths of one percent of gross sales would be utilized for national promotion.

It is banal to point out that the indicated expenditure is almost infinitesimal in comparison with the objective sought. But small as the price tag is, some producers will want to object and to haggle. If our own observations in the past have been correct, all of the objections, regardless of the terms in which they are stated, will have their origin in the sophomoric fear that non-member producers will be the beneficiaries of a program to which they have made no contribution.

This is a problem as old as our species, and we can see little hope for a solution this side of the millenium. We believe the intrinsic merit of the N.C.M.A. program is such that every intelligent, far-sighted producer will want to carry his fair share of the load. Once the program is adopted and set in motion, we as publishers will lose no opportunity to remind the free riders of their moral obligation to give it financial support.

This new undertaking by N.C.M.A. should serve to rally all who hold the honest belief that modern concrete masonry has no superiors in the entire field of building materials. If at this advanced stage of the block industry's development there are still a few individuals who continue to derive their living from the product without sharing this belief, we doubt very much that their unearned dividends from a national merchandising program will postpone for very long their departure into less demanding fields of endeavor.

William M. Avery

Another Leader★ IN THE PRODUCTS INDUSTRY PREFERS BESSER VIBRAPACS!

★ This is the 101st of a series of ads featuring leaders of the Concrete Products Industry who are stepping up block production with Besser Vibrapac machines.

Mr. and Mrs. Alfred L. Cossitt of Cossitt Concrete Products, Inc., Hamilton, N. Y.

A *Minimum* of "Down Time" Assures *Maximum* Block Production!

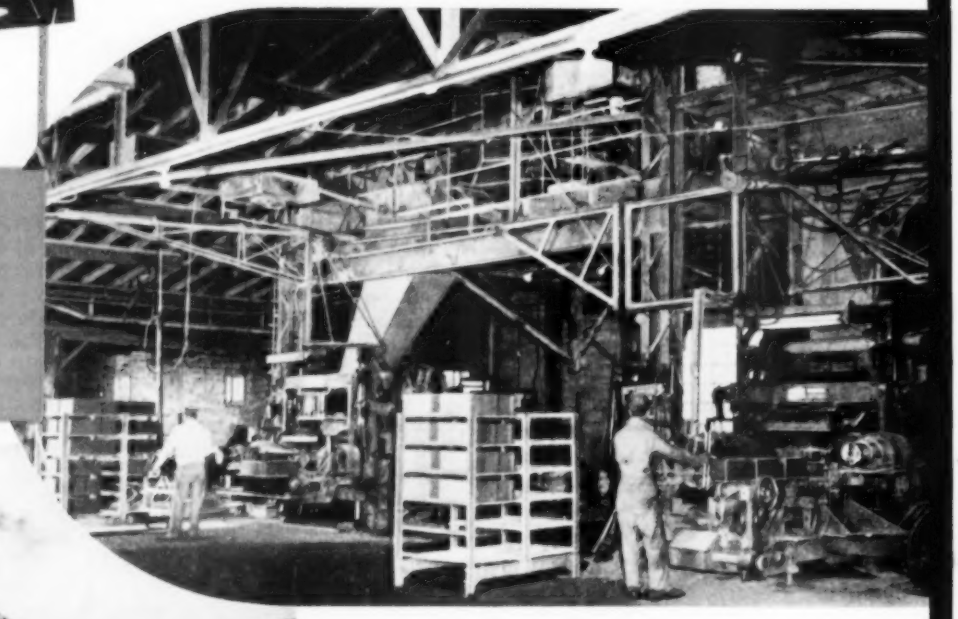
Cossitt Concrete Products, Inc., Hamilton, New York installed their first Besser Vibrapac in May 1947. Another Vibrapac was added in 1950 while a third machine is to be installed in early Spring. Mr. Cossitt writes: "To be successful in a highly competitive field you must have the best equipment available and that means Besser equipment in the Concrete Products Industry."

In addition to concrete block in all types and sizes, the Cossitt Company manufactures "Dox Block" floor and roof planks.

Mr. Cossitt states further "We have a great deal of respect for our machines, the more they are used. That's because they hold up so well after constant use. We have enjoyed doing business with the Besser Manufacturing Company and certainly feel they have a superior product."

BESSER MANUFACTURING CO. • Alpena, Michigan, U. S. A.

Complete Equipment for Concrete Products Plants



Interior view at the Cossitt Concrete Products Plant, showing two Besser Vibrapacs in action. Three 8" x 8" x 16" modular block produced on one Plain Pallet. Other sizes produced in equivalent multiples on the same set of Plain Pallets. Each machine is fully automatic. Hand labor is reduced to pushing a switch button and guiding a power off-bearing hoist.

Exterior view of the Cossitt Plant at Hamilton, New York, showing stock piles of concrete masonry units produced with Besser Vibrapac machines. Note particularly the preponderance of chimney block in the foreground.

BESSER

BATCH MIXERS | SKIP LOADERS | BLOCK & BRICK CUBERS | SUPER VIBRAPAC | SINTERING PLANTS | ACROW CENTERS | ROOF TILE MACHINE

news of the concrete industries

Dodson Acquires Facilities Of Interlocking Stave Silo In Expansion Move

Expansion is the rallying cry of the Dodson Manufacturing Company at Wichita, Kans., whose management recently purchased the silo business of the Interlocking Stave Silo Company. Dodson is currently completing a $100,000 expansion program involving the enlargement of the plant floor area and installation of a Besser Super Vibrapac block maker.

In addition to the Wichita facilities Dodson has a branch at Concordia and an Interlocking plant at Cherryvale, all of which are making concrete silo staves and block, as well as Zonolite aggregate. Glenn and Leon Dodson own and operate the business, which their father founded in 1910. Leon is president and Glenn is vice-president and secretary. Mrs. Leon Dodson is treasurer and office manager.

10,000-Ton Yearly Output Attained by Penn Crete

Tacony (Philadelphia), Pa., is the site of a new plant recently erected by the Penn Crete Products Company of Philadelphia. The original facilities at 20th and Lippincott streets in Philadelphia will be retained as the No. 1 plant, while the new installation will be known as No. 2. New Penn Crete lines and products will be developed at No. 2 plant, which will have a research and testing laboratory. Combined production of the two plants will be 10,000 tons annually.

Penn Crete makes colored Keen's plaster finishes, exterior stucco finishes, and waterproof coatings for masonry surfaces. President of the firm is Herman Kirshbaum, who founded the business in 1931. L. Roger Oest is in charge of production.

S. Dakota Products Concern Celebrates 50th Anniversary

One of the pioneer industries of Watertown, S. D., the Watertown Cement Products Company, observed its 50th anniversary on May 11, 12, and 13. Founded on May 29, 1903, by H. B. and W. H. Harris and Olaf Johnson, the firm at first limited its products to concrete units made by hand on a hand tamper. During the following year C. H. Atkinson became associated with the firm.

Gradually the company branched out, and soon contracts for construction and paving were accepted. The erection of concrete stave silos has now become one of the firm's major lines. Floor and foundation work was also done for a time. At present one of the main businesses of the firm is its ready-mixed concrete branch.

Present officials of the firm include the following: Merrill Allen, president; Vince Halverson, vice-president and sales manager; Ed Atkinson, second vice-president; Harvey Werner, secretary-treasurer; Art Mahanke, silo superintendent; and Ray Justus, plant superintendent.

Nemaco (manufacturer, exporter), 98 Smidsweg, Nijverdal, Netherlands, offers to export (direct or through an agent) concrete mixers, winches, hoists, iron cutters, and tile cutting equipment.

Coming Events

August 17-19, 1953—Atlantic City—Annual Meeting of National Cinder Concrete Products Association. Hotel Claridge.

September 10-12, 1953—Chicago. Third annual Short Course School of Instruction, American Concrete Pipe Association. Sherman Hotel.

September 28-30, 1953—Colorado Springs. Directors' meeting, National Ready Mixed Concrete Association and National Sand and Gravel Association. The Broadmoor.

October 29, 30, 1953—Houston. Southwest regional meeting, American Concrete Institute. Rice Hotel.

$30,000 Testing Program For Prestressed Concrete Launched at Tulane

According to an announcement issued by Dr. Rufus C. Harris, president of Tulane University, New Orleans, La., a $30,000 research project on prestressed concrete has been initiated at the university.

Ground was broken recently for a $20,000 testing frame to be built on the campus as the first part of the project, and the first public tests on prestressed concrete beams were scheduled to be run off in the near future. Sponsor of the Tulane testing frame is the Society of Tulane Engineers. Walter E. Blessey, associate professor of civil engineering at the university, will be the director.

Ammon, Sanford, Haley Take New Universal Posts

Universal Concrete Pipe Company officials have announced the appointment of Octave Ammon as district manager for the company's operations at Syracuse, Binghamton, and Rochester, N.Y.

The concern simultaneously made public two other changes in upstate personnel assignments; Melvin Sanford, superintendent at Binghamton, replaces the late Everett C. Winters, and William Haley has joined the company as sales engineer at Rochester.

Octave Ammon

William Haley

Purchase of the Long-Bell ready-mixed concrete plant at Coffeyville, Kans., by the Martin Concrete Products Company has been announced by Charles Martin Jr., part owner of the latter firm. It was stated that the firm will continue its operations at the present site.

...it's good business to take a SECOND LOOK at COST before you buy a truck mixer

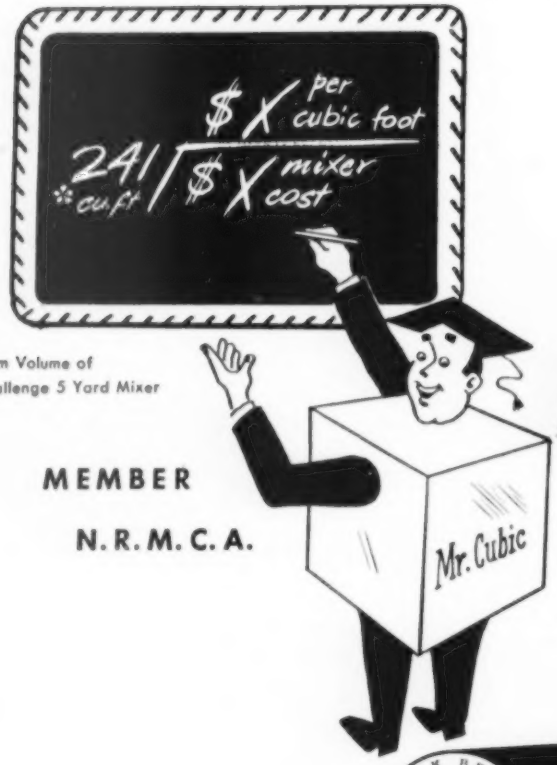
Today, everyone is keenly aware of cost.
"How Much?" is frequently the first question the buyer asks.
However, with truck mixers, the WAY cost is figured is extremely important.

cost per cubic foot of drum space

Here is the only true "unit of measure" in analyzing the dollar value and initial cost of a truck mixer.
After all, in accordance with TMMB* specifications, the total drum volume is the prime factor in determining the rated payload capacity of the mixer. Divide the price quoted on any mixer by the number of cubic feet in the drum. You will readily see that, size for size, Challenge Mixers give you MORE *mixer* with MORE *earning power* for your equipment dollar.

*Truck Mixer Manufacturers Bureau.

Take a "second look" at the rated capacity on the mixer you buy and determine the "cubics" in the drum . . . *it's the cost per cubic foot that counts!*



*Drum Volume of Challenge 5 Yard Mixer

MEMBER
N.R.M.C.A.

CHALLENGE TRUCK MIXERS

Are Made In 3 • 3½ • 4 • 5 • 6 • 6½ Cubic Yard Sizes

Standard of the Industry...

COOK BROS.
EQUIPMENT COMPANY
3334 San Fernando Road, Cleveland 6-3151
Los Angeles 65, California

Exclusive National Distributor For CHALLENGE TRUCK MIXERS . . . *Standard of The Industry*

Portland Industries Opens R.M.C.—Block Plant At Riviera Beach, Fla.

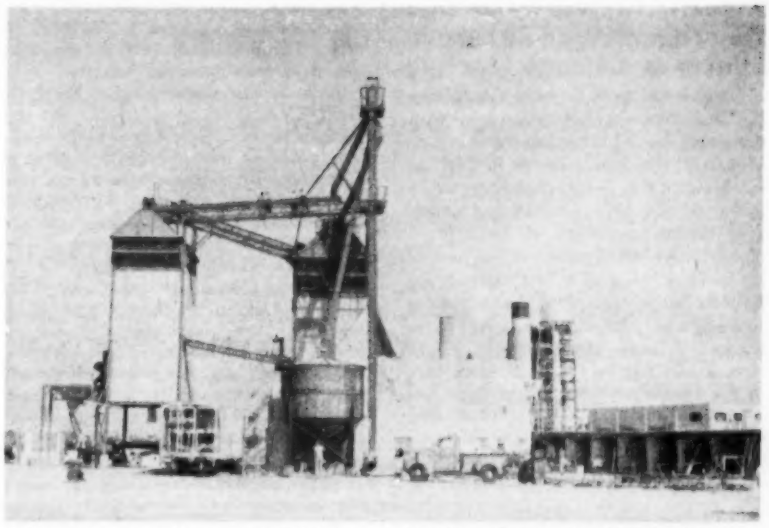
The new $500,000 dual ready-mixed concrete and concrete block plant of Portland Industries Inc., Riviera Beach, Fla., was formally dedicated on May 15. A large number of public officials and civic leaders of the Palm Beach—Riviera Beach area, as well as numerous concrete products manufacturers, attended the opening day event. The ceremonies included a local radio broadcast direct from the plant.

The plant, formerly the Wilson Concrete Products Company, is one of the largest and most modern of its kind in Florida. It is located at the Port of Palm Beach, and has facilities for receiving aggregates by barge. Rail facilities are also available.

The new plant features the latest equipment, including a three cu. yd. central mixing unit and an automatic block machine having a capacity of 1200 8-in. equivalents per hour. The firm expects to product more than 25 different kinds of block.

Officials of the company include Ben P. Gale, president and treasurer; Charles R. Wilson, executive vice president; Rosser D. Elkins, vice president in charge of production; and Dennis Hall, purchasing agent.

When operating at capacity, the plant will employ 50 persons and have an annual payroll exceeding $175,000.



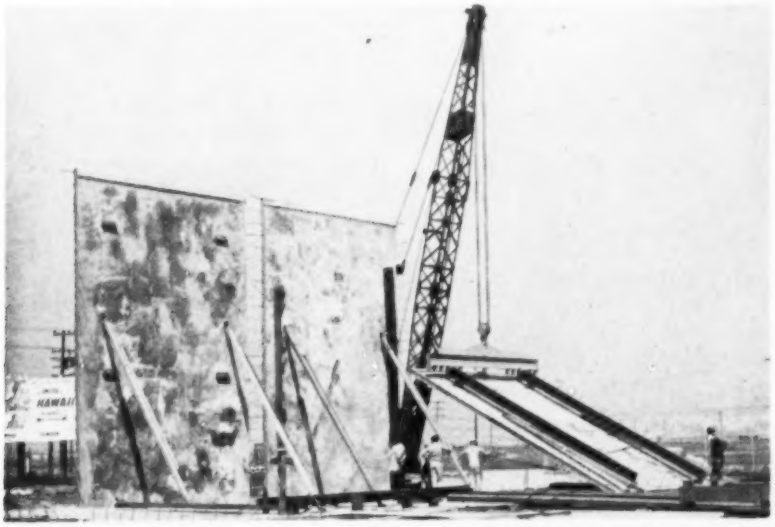
● General view of the new Portland Industries, Inc., plant at Riviera Beach, Fla. Ready-mix plant at left and block plant with steam kilns at right.

American Concrete Institute Regional Meeting at Houston

The American Concrete Institute's Southwest Regional Meeting will be held on October 29 and 30, 1953, at the Rice Hotel, Houston, Tex. The two-day meeting will place major emphasis on concrete construction practices and techniques. This will be the first Institute meeting held in the Southwest.

Program highlights include such topics as prestressed lightweight concrete, lightweight concrete used in oil refineries and chemical plants, shearing strength of anchor bolts embedded in concrete, cardboard "pans" for concrete floors, lightweight concrete for slabs-on-ground, and prestressed concrete piles. Attention will also be focused on outstanding concrete construction projects in the Southwest.

Co-chairmen for the event are Professor P. M. Ferguson, chairman of the department of civil engineering, University of Texas, Austin, Tex., and John A. Murlin, Texas Concrete Products Corporation, Austin.



● Walls 28 feet high, believed to be the tallest ever erected by the new tilt-wall method of construction, have just been completed for a warehouse at the San Francisco "push-button" maintenance base of United Air Lines. The walls consist of 48 slabs of reinforced concrete 6 in. thick. Except over doorways, the slabs are 20 by 28 ft. They were poured in molds on the ground, then crane-hoisted into place. Each weighs 19 tons. The complete warehouse will provide 56,000 sq. ft. of storage space.

Anchor Concrete Products Starts $425,000 Expansion

Anchor Concrete Products, Inc., Buffalo N. Y., has embarked on a $425,000 expansion program to install equipment for the autoclave process for curing building blocks at its plant according to President Frederick W. Reinhold.

He told members of the Western New York Chapter, American Institute of Architects, and engineers and contractors that the company is spending $250,000 now for three kilns and other equipment to cure the blocks under high-steam pressure. Another $175,000 will be spent in the next two or three years for five more kilns.

South Dakota Association Holds Annual Session at Pierre

On April 27 and 28 the Concrete Products Manufacturing Association of South Dakota held its annual meeting at Pierre, with producers from North and South Dakota, Wyoming, and Minnesota attending the sessions.

Among the speakers were the following: Professor Dennis Moe, South Dakota State College; Ray Minette, president of the Wisconsin association; William P. Markert, Chicago, director of promotion for the National Concrete Masonry Association; Bill Gage, Jr., Sioux Falls, S. D.; and Elmer Clasen, Mandan, N. D.

Plans for the construction of a $250,000 plant north of Edinburg, La., were announced by Frank M. Reising, owner of the Longhorn Concrete Pipe Company. Pipe in sizes up to 72 in. will be made at the new plant.

Red and green all-purpose concrete, packed in 50-lb. and 100-lb. bags, were announced recently by Gibraltar Floors, Inc., of Detroit, Mich. The firm also offers sets of standard notched forms (12 by 12 in. and 12 by 25 in.) for making stepping stones.

Autoclave Interests Discuss Co-ordination of Research Efforts at Chicago Meeting

Officers and members of the Autoclave Building Products Association met with representatives of other interested organizations at the Palmer House in Chicago on May 18 for informal discussions of the possibility of co-ordinating overlapping research activities in the field of high-pressure-steam curing. Chairman of the meeting was Ralph E. Cromis, Boice Builders Supply Company, Pontiac, Mich.

While no specific measures were adopted to bring about such co-ordination, it was felt by those who took part in the discussions that some progress had been made toward a better understanding of the problem. Among those who addressed the group informally was Professor John Selden, University of Toledo, whose outstanding work in the field of curing has been widely acclaimed throughout the concrete masonry industry.

At a luncheon meeting Dr. Beryl D. Orris, a practicing psychiatrist, lured the group away from shop talk into the fascinating field of human behavior. Judging from the rapt attention he received, this innovation might with profit be attempted at other industry meetings. Dr. Orris appeared on the program as guest of the Besser Manufacturing Company.

Also heard on the program was B. W. Bullock, Jackson & Church Company, Saginaw, Mich., who displayed samples and presented a general discussion of a new cellular concrete material which will soon be marketed under the trade name Calsi-crete. A full description of Calsi-crete and its properties will be found elsewhere in this issue.

● This picture attests to the durability of a concrete burial vault, product of the Comstone Vault Company, Tulsa, Okla., which was knocked from a truck in a vehicle accident. When the parked truck was struck by another speeding truck, the vault was thrown to the pavement, landing on one end, as shown in the photograph. Since no cracks were discovered in the dome, witnesses were convinced of the lasting qualities of the material, which withstood a shock strong enough to twist metal and smash heavy wood planking.

● The sales counter in the new office building of San Xavier Material, Inc., Tucson, Ariz., is built of 8- by 8- by 16-in. Lite Wate cinder units which were cut in half and lacquered. At the opening of the building visitors registered and were conducted through the plant and also to the construction yard of the San Xavier Rock and Sand Company. The firm was host at a barbecue, and guests were entertained by a Mexican group in native costumes.

The advertisement on the right hand page, addressed to architects and engineers, appears in Architectural Record, Engineering News-Record, Western Construction and Southwest Builder.

The most important 12 square inches on your Truck Mixer . . .

is the Rating Plate which certifies to engineers and architects that the machine meets quality standards. Insist on this Rating Plate. It assures you of approved equipment that is safe from obsolescence. It maintains the high standards on which the continued success of the ready-mixed concrete industry depends.

The usefulness of the plate slab, in present day construction, seems limitless. By designing this fashionable apartment building with 7½″ slab floors, the architects were able to: (1) encase all plumbing and utilities, (2) cantilever balconies 6′4″ beyond the building line, (3) soundproof all rooms, (4) eliminate ceiling beams, (5) dispense with plaster on ceilings, (6) save height in each story, (7) save costly formwork.

The builders needed only one set of forms to go up the 12 stories, pouring about one-third of a floor area at a time, straight through the winter.

Pouring schedules and strength specifications (3000 psi, increased to 3600 in cold weather) were most satisfactorily met with ready-mixed concrete, processed in truck mixers *certified* to have the correct design, capacity, mixing speed, mixing action and water control to insure a homogeneous material of uniform predetermined strength.

the things you can do with a slab

Look for this Badge of Dependability on Truck Mixers:

4½ CUBIC YARD MIXER
GUARANTEED TO HOLD MIX AND AGITATE ITS RATED CAPACITIES AND CERTIFIED TO COMPLY WITH TRUCK MIXER MANUFACTURERS BUREAU STANDARDS
AS APPROVED BY R.P.M.C.A.
6⅛ CUBIC YARD AGITATOR

You have a right to insist on this Rating Plate on any truck mixer that serves your jobs. It is available to all who comply with the quality standards which have been established by the Truck Mixer Manufacturers Bureau and approved by the National Ready Mixed Concrete Association.

These member manufacturers comply with Bureau standards:

Blaw-Knox Division
Pittsburgh, Pa.

Chain Belt Company
Milwaukee, Wis.

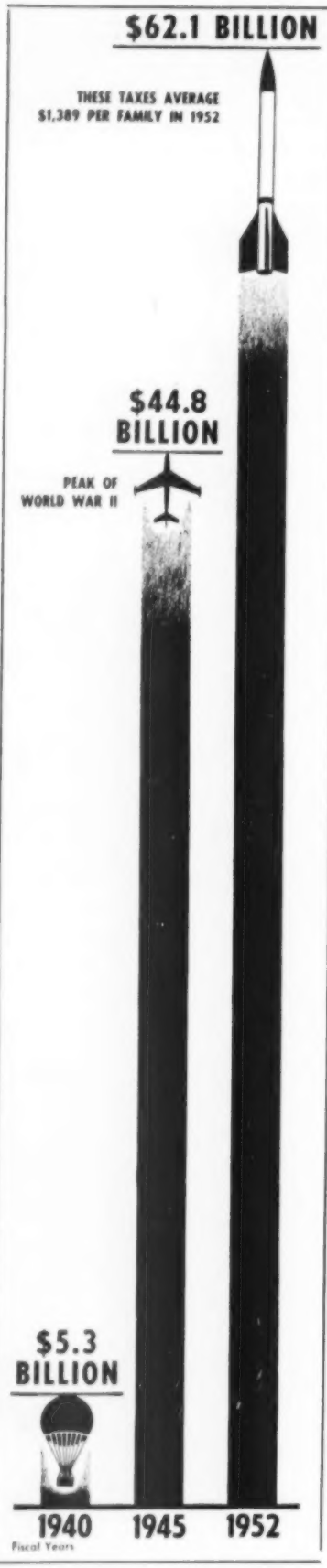
Concete Transport Mixer Co.
St. Louis, Mo.

Construction Machinery Co.
Waterloo, Iowa

The Jaeger Machine Co.
Columbus, Ohio

The T. L. Smith Co.
Milwaukee, Wis.

Worthington Corporation
Plainfield, N. J.

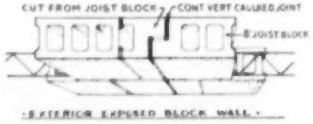


● Where is it going? That's what everyone would like to know. Arresting graphs of this type are being distributed by the Chamber of Commerce of the United States to bring home to Mr. Citizen the hard fact that federal taxes are heading for the stratosphere.

New Masonry Control Joint Developed by Oregon Firm

An ingenious control joint to relieve long masonry walls of possible stresses which might accumulate due to volumetric changes was recently designed by Jacobberger and Stanton, an architectural firm in Portland, Oreg.

The joint is vertical and continuous, running the entire height of the wall;



● Sectional view of a new control joint to relieve stress in masonry walls.

it is later calked and the exposed face of the joint is covered with a metal strip, anchored in the joint by spread fins. In spite of the metal strip covering, the joint has a neat and unobtrusive appearance. Masonry reinforcement may be used with the new type of control joint, as indicated on the accompanying diagram.

FHA Applications for April 36% Ahead of April, 1952

An upsurge in mortgage insurance applications being filed with FHA Field offices, following the reduced levels during the period of mortgage credit restrictions, was disclosed by Commissioner Guy T. O. Hollyday. According to reports from its 73 field offices, the volume of applications for mortgage insurance is running 20 percent above last year for the first four-month period. This gain over last year has been increasing from month to month.

Commissioner Hollyday pointed out that the FHA plan has been used in producing one out of every four new houses in the country. Applications received by FHA during the first four months of this year covered 205,700 units. Of these, well over half, 130,700, involved new construction. Both in total number of applications received and in new construction applications the FHA volume this year is 20 percent greater than during the same period in 1952.

Compared with a decline of 15 percent in new construction applications during January and an increase of 36 percent in new construction applications in April, the first week in May shows more than double the volume of new construction applications reported in the same week in 1952.

While such a large percentage increase over 1952 will probably not be maintained throughout the remainder of 1953, an average increase of the 20 percent for the remainder of the year would result in a total volume of more than 635,000 applications for the year.

Dodge Corp. Reports Show Construction Boom For Five-Month Period

The construction boom in the 37 states east of the Rockies continued to spiral towards a 1953 all-time record in contracts awarded as five-month totals gave the current year an 8 percent edge over 1952, it was reported by the F. W. Dodge Corporation. The five-month 1953 figure was $6,792,329,000 according to Dodge totals.

Nonresidential building for five months showed the greatest increase over 1952, with a $2,492,801,000 total, which was up 16 percent The residential awards total at $2,795,412,000 was up 1 percent. Heavy engineering (public works and utilities) at $1,504,116,000 was up 11 percent.

The Dodge Reports construction total for May was $1,606,091,000 or 8 percent behind April, but 3 percent ahead of May, 1952. Individual May awards showed nonresidential contracts of $582,-061,000, down 15 percent from April, but up 26 percent over May of last year. Residential awards of $637,721,-000 were 5 percent less than April and 15 percent less than May, 1952. The heavy engineering total at $386,309,000 was less than 1 percent below April and was 11 percent above may of a year ago.

Federal Building Awards Total $4,400,000,000 in 1952

The value of contracts awarded for new construction financed wholly or in part with federal funds rose 5 percent in 1952 to $4,400,000,000, according to preliminary figures just released by the U. S. Labor Department's Bureau of Labor Statistics. The 1952 total is almost three-fifths as large as the $7,900,000,000 contract-award figure in 1942, when federal construction, because of the war effort, was at an all-time high.

The 1951-52 increase of $219,000,000 reflected mainly a continued expansion of federal industrial and electric-power facilities, and a sharply accelerated program of federal warehouse building. Industrial construction showed the largest dollar increase from 1951 mainly because of continued expansion by the Atomic Energy Commission. Contract awards for federally owned industrial plant amounted to $1,200,000,000 in 1952, an increase of 37 percent over 1951.

Contract awards for new federally-aided highways advanced 17 percent to a record total of almost $1,000,000,000 in 1952, although some programs were delayed because of steel shortages.

Because of the need to supply schools in overburdened defense districts, contract awards for educational building rose 41 percent over the year to a total value of $85,000,000 in 1952—the largest recorded annual total.

From the *Consolidated Rock News* (Consolidated Rock Products Company, Los Angeles, Calif.), *Some minds are like concrete—all mixed up and permanently set.*

(Inset) Harry Deshler, President Superior Building Products, Inc. Plant is housed in a 50' x 162' concrete block building, produces 440-8 inch equivalents per hour.

Stronger Blocks made without steam

THERMOBLOC Direct Fired Heater Makes

New Process More Efficient and More Economical

The Superior Building Products, Inc. of Toledo, Ohio, makes no secret of its production of higher tensile blocks at less cost.

Using heated air from a Thermobloc oil-fired heater, augmented by a fine water spray, the Company's method has resulted in faster, more economical curing with unloading breakage being practically eliminated.

A seven-day test on an 8-in. heavyweight block shows a strength of 864 psi gross area. A fourteen-day test of the same block shows a strength of 1405 psi.

No live steam is used in the process. Curing is accomplished through heated air furnished by a Thermobloc Heater. The compact, self-contained unit heats two kilns while occupying less space than is used by one block rack! Heat output is 200,000 btu. Air is circulated at rate of 2400 cfm. Fuel consumption averages an insignificant 1.75 gal. of No. 2 oil an hour.

For complete details on efficient, economical curing of concrete blocks, use the coupon for interesting booklet.

Model 200 Thermobloc. Unit heats two kilns. Note compactness.

THERMOBLOC ADVANTAGES FOR CURING CONCRETE BLOCKS

- Helps make stronger, more salable blocks.
- Insignificant unloading breakage.
- Low initial investment—Eliminates expensive boiler, pipe lines and installation.
- High heat efficiency—87% efficient in the above installation.
- Needs no attendant—Automatic temperature controls.
- Low operating cost. Economical clean fuel.

THERMOBLOC DIVISION

PRAT-DANIEL CORPORATION

Manufacturers of P-D Power Plant Equipment

15-7 Meadow Street South Norwalk, Conn.

Loading a 2-ton truck. Two such trucks deliver blocks within a 20-mile radius of the plant. Loading and transportation breakage is practically nil.

THERMOBLOC DIVISION
Prat-Daniel Corp.
15-7 Meadow Street, South Norwalk, Conn.

Gentlemen:
Please send me your booklet "Curing Concrete Block the Thermobloc Way."

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____ CITY_____ STATE_____

● 500,000 safe miles of driving their big concrete mixer trucks around the Pittsburgh area brought six drivers for Dravo Corporation's Keystone Division special safety awards. L. P. Struble (left), general manager of the division, is shown presenting the awards to the drivers. They are (left to right) Wayne Noss, Edwin Frair, Charles Paris, John Hess, Joseph Curc Jr., and Paul Papera.

Fifth Concrete Conference Held at Ann Arbor, Mich.

On April 14 and 15 the fifth Annual Concrete Conference, sponsored by the Portland Cement Association and the University of Michigan, was held at Ann Arbor.

At the opening session on concrete aggregates, members were addressed by D. W. Lewis, Purdue University, and Stanton Walker, director of engineering for the National Ready Mixed Concrete Association and the National Sand and Gravel Association. A film entitled *How to Make Quality Concrete* was a feature of the second session. Talks were given by E. C. Wenger, Conservation Bureau, P.C.A., John D. Bolton, Evanston, Ill., F. E. Legg Jr., University of Michigan, and E. B. Oberly, New York District, P.C.A.

The progress report on prestressed concrete constituted the topic of the next session. Papers were given by P. F. Rice, district structural engineer, P.C.A., F. N. Menefee, University of Michigan, and Jean Muller, Freyssinet Company, Inc., New York, N.Y. Speakers at the final session included the following: Sol King, Albert Kahn, Associated Architects and Engineers, Inc., Detroit; Alfred L. Parme, structural analyst, P.C.A., Chicago; Louis P. Corbetta, Corbetta Construction Company, Chicago; and E. B. Oberly.

Buffalo Ready Mix Concern Sold and Reincorporated

The Buffalo Gravel Corporation, Buffalo, N. Y., which produces ready-mixed-concrete, has been purchased by a group of local businessmen and several employes of the corporation from the L. B. Smith organization. The purchase price was not disclosed.

A new corporation has been formed for the operation of Buffalo Gravel under the same name. Edgar B. Maloney has been elected president and Carlton J. Lewis vice-president of the new organization. Mr. Maloney was vice-president of the old Buffalo Gravel concern, and Mr. Lewis was general manager.

Buffalo Gravel operates a fleet of 55 trucks, of which about 45 are ready-mixed-concrete units. It operates two yards in Buffalo and also facilities in connection with the Buffalo Slag Company in Lackawanna.

Buffalo Gravel was purchased by Mr. Smith in 1943. He originally acquired the company to liquidate it, but under Mr. Maloney's guidance the business became a thriving concern.

A new booklet, *The Incentive Story*, revealing plans used by top companies to get people to do better work, is being offered to business executives by Cappel, MacDonald & Company, Dayton, Ohio, incentive firm. A life-like format illustrates all phases of "incentive" planning.

$1,000,000 Solite Plant Planned in North Carolina To Open in Six Months

Southern Lightweight Aggregate Corporation officials have announced plans for the construction of a $1,000,000 Solite plant in Acquadale, N. C. This firm operates at Bremo Bluff, Va., what is said to be the largest plant of its kind in the world, producing a controlled lightweight aggregate.

In making the announcement, John W. Roberts, president, stated that the North Carolina operation will be carried on by The Carolina Solite Corporation, a wholly-owned subsidiary of Southern Lightweight Aggregate. The company has recently purchased several new shaly-slate deposit sites of which the Acquadale property is the first to be activated.

The new plant will be in operation in about six months, manufacturing Solite, which is not a by-product, but a controlled lightweight aggregate used in place of sand, gravel, and crushed stone in the manufacture of concrete building units, structural concrete, bridge floors, and buildings.

Solite is manufactured by a process similar to that used in the making of portland cement. Crushed shaly-slate is processed in long kilns, where it is expanded under tremendous heat and then allowed to cool and anneal. This controlled manufacturing process assures uniform consistency in the lightweight aggregate and offers many outstanding construction advantages. Concrete made with Solite is reportedly one-third lighter than concrete made with natural aggregate. Solite masonry units are one-half lighter than ordinary concrete blocks, strong and durable, fire-resistant, rust-proof. In addition, they are said to have outstanding heat-insulation and sound-proofing qualities. Lightweight concrete and masonry units made of Solite has been used extensively throughout Virginia and other eastern states.

● Cranes handle hot aggregate from the kilns (background) at Bremo Bluff, Va.

BORN *with the* BEAUTY BUILT IN

Crowning its Cinderella success story, concrete block <u>now</u> can be made by <u>you</u> as a glamorous "*finished*" building material—a monolithic 100% concrete masonry unit produced in one piece by a simple extension of normal block plant operation.

Born with the built in beauty of a smooth, shiny marble-aggregate concrete face on one or both sides Marble Face Block is already used in hundreds of installations in the ultra-conservative New York market. During the last three years, nationally prominent architects and builders* have specified Marble Face Block for interior and exterior use on buildings ranging from modest homes to huge air terminals.

. . . face and block — one piece . . .

YOUR customers will likewise acclaim the cost saving versatility of block that permits them to erect *in a single masonry operation loadbearing walls, completely finished on both sides, one color inside and another color outside.*

You can add this highly profitable new business to your normal output with little departure from established manufacturing practice and at a moderate investment.

Our exclusive franchises offer fellow block producers every assistance — technical and marketing — to fully exploit the proven profit potential of our patented process. Please write us for more information.

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California Block Makers Visit Builders Supply Plant in Phoenix

THE Builders Supply Corporation of Phoenix, Ariz., was host to the California Concrete Masonry Manufacturers Association at Phoenix from June 5 to 7. Arriving together in a special section of the Southern Pacific Golden State Limited, the 55 members of the California association were met at the depot. After interviews by the press and the usual photography, the party was escorted to beautiful quarters at the Desert Inn Motel. Many took advantage of the beautiful swimming pool and patio around the pool. The Desert Inn Motel, a two-story structure a block long, is built entirely of Superlite pumice blocks and is completely air conditioned.

By GILBERT E. OLSON
Builders Supply Corporation
Phoenix, Ariz.

The trip from Los Angeles to Phoenix on the beautiful air-conditioned Golden State Limited provided several hours of delightful fellowship for the association group. Naturally, leaving their business cares behind them, the spirit of adventure and relaxation soon captivated the entire group. The various manufacturers had a pleasant chance to talk to their competitors, exchange ideas, and get acquainted.

Here the party is seen walking through a lane in the storage yard, where 4,500,000 blocks were stacked in cubes.

Most of the members brought their wives with them on the tour, an arrangement which made possible a better understanding and acquaintance among the real bosses of the association.

On Saturday morning after a number of press interviews the entire party was taken by chartered bus to the main plant of the Builders Supply Corporation for an inspection tour. Here they were able to see one of the largest block plants in America in full operation. Six Besser Super Vibrapacs operating 24 hours a day on a three-shift basis, were making Superlite blocks. The visitors also saw a Kent Lintelator at the end of the line making concrete lintels and sills.

Starting at the beginning of the manufacturing procedure, the group was shown first the railroad siding, which has a capacity of 14 rail cars. The raw pumice and scoria is brought in special Santa Fe cross-hopper-bottom cars and spotted over an underground trap receiver into which the material is dumped through trap doors under the cars. Conveyors carry the raw material up out of the trap into a primary 16- by 36-in. Blake type jaw crusher. Then the material is lifted by elevators to a 4- by 12-ft. Symard double-deck vibrating screen for primary separation. Oversize material is then transferred to two sets of roll crushers, one a MacFarland 16- by 36-in. twin-drive roll and the other a 14- by 24-in. Allis-Chalmers roll. The crushing and sizing plant is a closed circuit which finishes the material. The material is then transferred by conveyors to four large storage bins having a capacity of 12 carloads each, or a total of 48 cars. All raw pumice and scoria comes from mining operations and mines owned by the Build-

(Continued on page 271.)

The visitors watched a demonstration in which 1,080 standard units were unloaded in 20 minutes. The unloading device was developed by the Builders Supply Corporation.

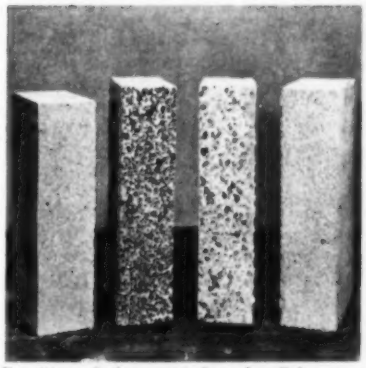
Cellular Concrete

New material called Calsi-crete utilizes preformed foam process

another ON THE SPOT report

RENEWED interest and activity in the whole field of cellular concrete in the United States may result from the introduction of an aerated calcium silicate hydrate material which will shortly be manufactured and merchandised under the trade name "Calsi-crete". As is the case with all true cellular concretes, this new material differs from so-called lightweight concrete in that weight reduction is achieved in large measure by incorporating air as an aggregate. It is expected to meet a wide range of building needs at appreciable cost savings.

In the case of Calsi-crete the desired weight reduction is accomplished by mixing a preformed foam with a slurry consisting of cementitious and siliceous materials and water. The foaming material used is a hydrolized protein in a diluted water solution which is emulsified with air and mixed into the slurry at the bottom of a whirlpool mixer. The process is said to be entirely independent of temperature, and the end product shows no indications of undesirable directional characteristics, *i.e.*, strength in a vertical plane less than in a horizontal plane. Among other advantages which are claimed by the developers is that faulty mixes can be recognized and corrected while the material is still in the mixer. The aerated mixes can also be pumped considerable distances with only a small and predictable loss of air.



Densities of these samples of cellular concrete are (left to right) 40 lb., 50 lb., 44 lb., and 10 lb. per cu. ft.

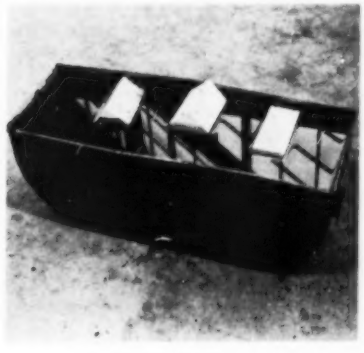
The aerated wet mix which results from the injection of preformed foam is either cast or pumped into large molds, allowed to take on an initial set, and is then cut into desired sizes and cured in high-pressure autoclaves. The product is ready to be placed in structures within 24 hr. of the time the materials are mixed.

Although from the manufacturing point of view portland cement has certain advantages in the production of Calsi-crete, the process lends itself quite well to the use of any desired proportion of lime. Since any source of active silica may be used, a wide range of readily available raw materials may be employed. Even clays containing as little as 20 percent silica appear to produce satisfactory results. Among the raw materials which have been used successfully are expanded shales and clays, foamed slags, fly ash, pit sands, pumice, ground cinders, and vermiculite.

One of the important advantages claimed for the Calsi-crete process is that it enables the manufacturer to control within reasonably narrow limits the amount of aeration in any type of mix. Thus, a particular mix is designed to yield cellular concrete having no more strength than the end product will need in service. Calsi-cretes having a density of 50 lb. per cu. ft. may in extreme cases be produced in strengths as low as 200 or as high as 2,000 p.s.i. "K" factors for Calsi-crete vary with the dry density, ranging from 1.1 for materials weighing 40 to 45 lb. per cu. ft. to 0.56 for those weighing 20 lb. per cu. ft. A 6-in. solid Calsi-crete wall weighing 45 lb. per cu. ft. has a "U" factor of 0.16. When the material is cured with high-pressure steam, it is reported to show no irreversible shrinkage. This property, in combination with high resistance to moisture penetration, is said to limit wetting and drying movements to about one-third the magnitude usually associated with unautoclaved concrete products.

It is believed that the primary initial market for Calsi-crete products here in the United States is in the field of reinforced roof planks and insulating roof slabs. Other im-

Low absorption of these cellular concrete specimens is at least partly due to the fact that the cells are non-interconnecting.



This concrete is light but strong. Three men, weighing an aggregate of more than 600 lb., stand on a 3-in. thick re-inforced roof slab of 40 lb. per cu. ft. density. K factor is 1.03 B.t.u's. The gentleman at the left is John Wallace, technical director of Calsi-crete Corporation.

A demonstration proving that this concrete can be successfully nailed; it also provides an excellent key for plastering.

portant possibilities include infills for prefabricated building components, partition wall slabs, external insulating slabs, reinforced beams, and cold storage and refrigeration applications.

Aerated calcium silicate hydrate materials have been used in England and in certain European countries since shortly after World War II. Their success, and the increasing volume in which they are being produced, may augur well for a similar development here in the United

A slab of the material can be sawed or cut easily on a straight line.

States. As this issue goes to press, we are advised that the first full-scale plant for producing Calsi-crete roof planks will soon be completed at Detroit. It is our hope and intention to visit this plant as soon as it is operating satisfactorily and give our readers a first-hand report of its performance.

The Calsi-crete process was developed by S. Dilnot, and it is being offered on a license basis to qualified firms in the United States and Canada by the Calsi-crete Corporation of Saginaw, Mich., a wholly-owned subsidiary of Jackson & Church. Directors of the new company are David L. Perrot, Clifford W. Stewart, Boyd W. Bullock, and Ernest D. Kiley. John Wallace, who has worked closely with Mr. Dilnot for the last eight years, is technical director of the firm.

Cliff L. Hodgert of Salt Lake City was recently named president and general manager of the Arizona Pre-Cast Concrete Company at Mesa, Ariz. Mr. Hodgert was formerly vice-president and a director of the Cudahy Packing Company, and since his retirement from that post in 1950 he has been vice-president and general manager of Archie McFarland and Sons, meat packers. He recently acquired an interest in Arizona Pre-Cast from Darl Anderson, originator of "Tuff-lite" block.

Unusual Methods Employed To Carry Cross-Bay Line

Concrete substructures for the steel towers carrying an 8-mile transmission line across lower San Francisco Bay recently involved novel uses of both precast concrete and a batching-and-mixing plant mounted on a barge.

Involved were 19 major underwater tower foundations. Engineering for the project was carried out by the owners, the Pacific Gas & Electric Company, while the general contractor for the substructures was Ben C. Gerwick, Inc., San Francisco.

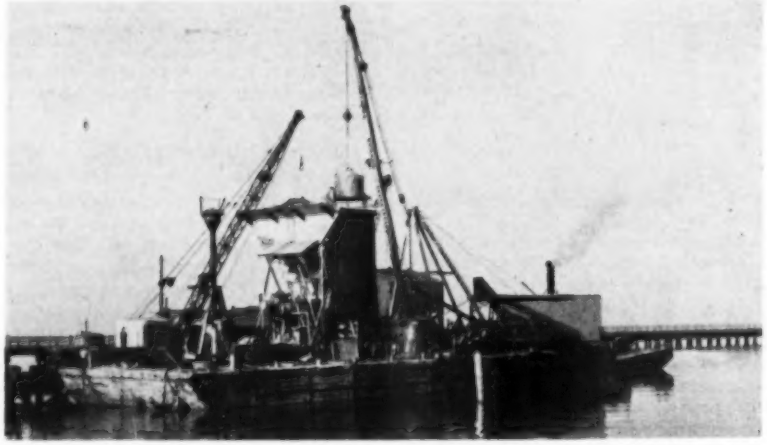
The route of the transmission line was parallel and adjacent to the San Mateo toll bridge across the lower bay. Heavy bridge traffic and the absence of sidewalks, however, prevented the contractor from using the bridge for any purpose, even for surveying or transporting personnel. The bridge actually was a hindrance since it made the use of anchor lines impossible on the bridge side and greatly restricted the mobility of the floating equipment.

Concrete piles, 19-ft. diameter concrete shells, and concrete connecting girders used in erecting the underwater piers by a method eliminating the need for cofferdams, were all precast at the contractor's permanent casting yard on Petaluma Creek, an arm of upper San Francisco Bay 50 miles distant. They were towed to the job-site by tugs and barges. Water depth ranged from 8 to 60 ft.

The batching-and-mixing plant, which prepared all the concrete needed on the job, was erected on a 1,000-ton barge. In addition to the Noble 100-ton-semi-automatic batch plant, the barge also carried the 1½-cu. yd. mixer and the necessary engines, pumps, fresh-water and fuel tanks, compressors, a derrick for loading the four-compartment aggregate bins and the 500-cu. ft. bulk cement silo, and a crane for pouring the concrete.

The batch plant was a standard model, cut down to reduce height and otherwise modified to keep the center of gravity as low as possible. Scales were specially mounted to insure accurate measurement when the waves caused the barge to pitch and roll.

Aggregates were brought to the floating plant by barge, while the cement was trucked in. Steel containers each holding 26 bbl. were transferred to a service barge which then delivered them to the floating concrete plant moored out in the bay. The service barge, primarily a carrier of fresh water for mixing, had its water tanks below deck, the cement cans being carried on the deck proper.



● At the toll plaza of the San Mateo Bridge (background) the floating batch plant was tied up for the job of installing 19 underwater tower foundations. Aboard, in addition to the 100-ton batch plant, were a 1½-cu. yd. mixer, engines, pumps, fresh-water and fuel tanks, compressors, a derrick, a crane, a 500-cu. ft. bulk cement silo, and aggregate bins.

The shells which supported the piles at bay-bottom were filled with concrete by tremie pipe. Two of the 19 foundations each required a filling of 800 cu-yd. and the others about 200 cu yd. More than 60 percent of the concrete in each tower substructure had to be placed under water.

Communication between the various barges, tugs, and derricks was by 2-way radio. Construction was under the direction of H. Haberkorn, engineer of hydro-electric construction for the Pacific Gas & Electric Co. Project manager for the contractor was Don Weaver.

Properties of Cavity Walls, by Daniel S. Goalwin, a National Bureau of Standards Building Materials and Structures Report 136, gives a compilation of data on the performance characteristics of cavity walls, which are masonry walls consisting of two parallel wythes or tiers of masonry separated by a continuous air space, usually two inches wide. Order from the Government Printing Office.

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Minneapolis Firm Opens Kansas City, Kans., Plant

Opening of a new plant in Kansas City, Kans., was announced recently by J. M. Lambert, president of the Twin City Concrete Products Company of St. Paul, Minn. The firm produces dry ready-mixed concrete and distributes Medusa cement paints.

It was indicated that the Kansas City plant will take the pressure off the Minneapolis plant, where current production exceeds 2,000 bags per day. The parent plant, now five years old, has shown an annual production increase of 30 percent. Cost of the new facilities at Kansas City was between $50,000 and $60,000. Only Sakrete will be produced at this plant.

Sand Blasting Treatment Improves Masonry Surface

The texture and color tone of concrete block may be greatly improved by a treatment of light sand blasting. This discovery has resulted in a practical, inexpensive method of enhancing the appearance of either interior or exterior walls of concrete block. It was developed recently by Mac Isaac and Menke Company, general contractors of Los Angeles, while doing construction work for the Consolidated Western Steel Co., Division of U. S. Steel, at the Maywood plant.

Exterior walls were erected with block having a composition of volcanic lava aggregate having a slight reddish cast grayed down by the cement binder. A light sand-blasting of the completed wall resulted in exposing the red aggregate slightly and gave a new depth of color tone and a richness of texture that won complete approval.

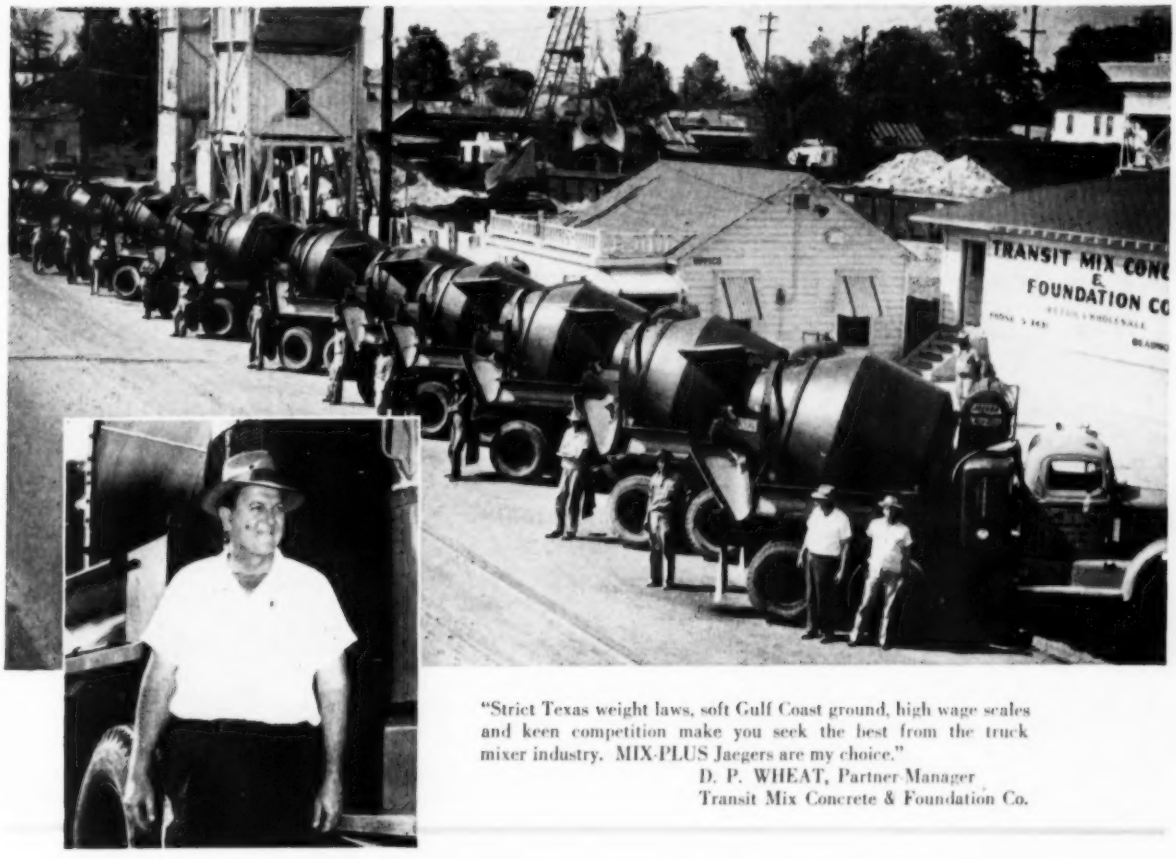
Although the cost of the surface finishing by this method was found to be higher than painting because of the necessity of applying waterproofing to the brick after blasting, technicians at Mac Isaac and Menke feel that where richness of texture and softness of color tone are desirable, the increase in cost will assume less importance.

The cost of blasting each 1,200-ft. unit of surface was approximately $100, about equal to the cost of painting. Waterproofing the same area came to about $60, and sand blasting time for each 1,200-ft. unit was five hours.

Air was supplied for the blasting by a 500-ft. c.f.m. diesel-powered Le Roi-Rix air compressor, but MacMen points out that half this capacity would be sufficient for the work. The Kelso sandblasting equipment and the sand pot were truck-mounted on a GMC. The blasting was not done until several days after the wall was constructed, to allow time for proper setting of the mix.

The waterproofing used was Silinite, a transparent repellent manufactured by Armor Laboratories, Inc., Glendale, Calif. Application was done by spraying to flush the repellent thoroughly into the rough texture, developed by the blasting.

The preliminary announcement of the American Concrete Pipe Association's third annual Short Course, to be held from September 10 to 12 at the Sherman Hotel in Chicago, states that arrangements have been made with the hotel management for space for a limited number of exhibits. Howard F. Peckworth, A.C.P.A. managing director, reminds members that booths will be allocated in the order of applications for space.



"Strict Texas weight laws, soft Gulf Coast ground, high wage scales and keen competition make you seek the best from the truck mixer industry. MIX-PLUS Jaegers are my choice."

D. P. WHEAT, Partner-Manager
Transit Mix Concrete & Foundation Co.

D. P. Wheat now hauls 66⅔% bigger payloads with this Jaeger fleet

When Texas began active weight law enforcement, Transit Mix Concrete & Foundation Company, at Beaumont, had a fleet of older type 3 yard mixers on single axle trucks that could not legally haul their rated capacity. To comply, partner-manager D. P. Wheat converted to tandem axle White trucks. However, this proved uneconomic in the face of higher wage scales and keen competition.

By replacing his 3 yard mixers with 4½ yard Jaeger MIX-PLUS models, Wheat found that he could haul 5 yard payloads with the same trucks and drivers — and do it legally with 31,000 lbs. on tandem rear axle and 8475 lbs. on the front.

Moreover, round trips were speeded up by the faster operation of the new truck mixers; concrete could be spotted faster with Jaeger's 13 ft. "to-the-spot" chute and it took less time to temper concrete to customers' requirements because of Jaeger's high pressure water jet (60 gpm @ 65 psi), located in the head of the drum. Wheat's first 10 Jaeger 4½ yard units proved so profitable that he has since purchased 4 more.

Jaeger MIX-PLUS truck mixers, on standard trucks, are engineered to increase your legal payload and number of daily payload trips — and do it without resorting to short-lived construction or unacceptable non-standard drums. For full information, see your Jaeger distributor or send for Catalog TMH-2.

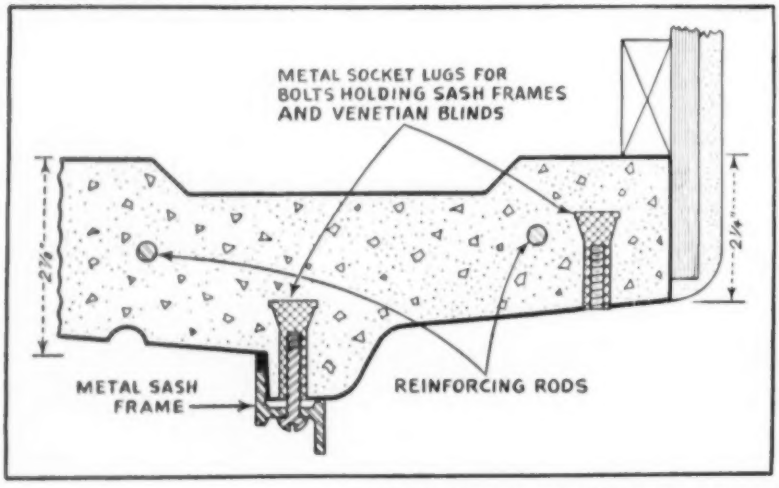
4½ CUBIC YARD MIXER
GUARANTEED TO HOLD MIX AND AGITATE ITS RATED CAPACITIES AND CERTIFIED TO COMPLY WITH TRUCK MIXER MANUFACTURERS BUREAU STANDARDS AS APPROVED BY N.R.M.C.A.
6½ CUBIC YARD AGITATOR

THE JAEGER MACHINE COMPANY

602 Dublin Avenue, Columbus 16, Ohio

Truck Mixers • Agitators • Pumps • Compressors • Concrete Mixers • Paving Machinery

Florida Firm Makes Big Business Of Precast Concrete Window Frames



another ON THE SPOT report

ONE of the many attractions of southern Florida from our somewhat specialized point of view is the evidence at every turn of a completely uninhibited willingness to use precast concrete for purposes as yet undreamed of in other sections

By WILLIAM M. AVERY

of the country. The phenomenon is most easily explained on the basis that most of what are now regarded as conventional uses of precast concrete and machine-made products were firmly established practices in many Florida communities at a time when the concrete industries in other localities were struggling for initial recognition. Thus there has been a comparatively long history of development which has been greatly encouraged by the wide acceptance

Top: General view of the Livesay Window Company's plant at Miami, Fla. Elevators and bins at the left are for the handling and storage of cement and aggregates.

Center: Forms are stripped, cleaned, oiled, and prepared for pouring on a modified assembly-line basis.

Left: Head cross-section of a typical precast concrete window frame. Note the alloy inserts for anchoring sash and venetian blinds.

of concrete for a multitude of building needs.

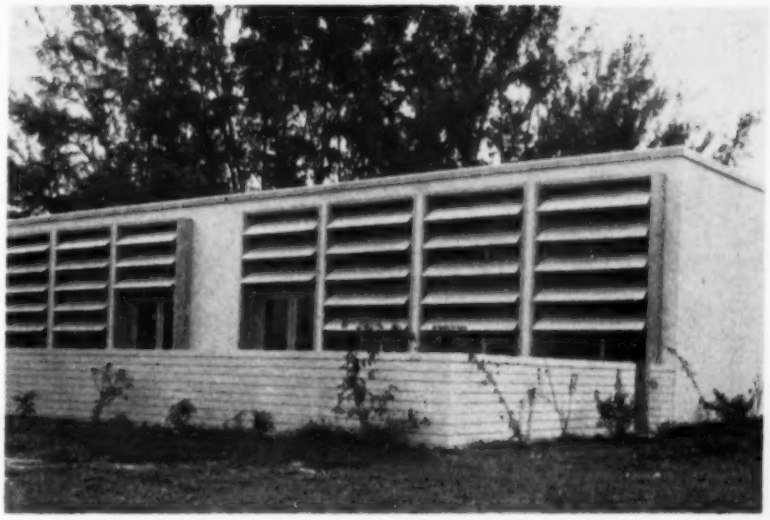
The operations of the Livesay Window Company, Inc., in Miami represent a case in point. This firm began experimenting with precast concrete frames for windows and doors back in 1937, and its achievements qualify as pioneering in the strictest sense. The first three years were devoted almost exclusively to development work, but by the summer of 1940 the major design and production "bugs" had been eliminated and the company had a salable and dependable product to offer local builders. Today Livesay window and door frames are offered in a wide range of types and sizes, and their almost universal acceptance is indicated by the fact that production averages between 8,000 and 9,000 units per month, and has on occasion soared as high as 14,000 units.

The frames are cast in well-braced pressed steel forms, most of which are equipped with short legs which facilitate handling with fork trucks. The forming of the steel is done by an outside source, but the work of assembly, welding and grinding is all done in the company's own well-equipped shops. The molds are built to very close tolerances so that the precast frames will fit tightly into the openings for which they are designed. The Livesay company's precision casting method includes very accurate positioning of the threaded alloy inserts which are cast into the frame to hold sash frames and venetian blinds.

Production is handled insofar as possible on an assembly-line basis, with forms being cleaned, assembled, and oiled at one end of a long casting floor while pouring operations are in progress at the opposite end. The ¼ - 20 alloy inserts, which are called Kasement-Klamps and are purchased from Precision Devices, are bolted to the forms through accurately positioned holes, whereupon lift trucks move the forms to an intermediate position for spray-oiling. A lift truck then picks up one form and transports it to the pouring area. A small power screw driver is used to speed up the work of attaching the threaded inserts to the molds.

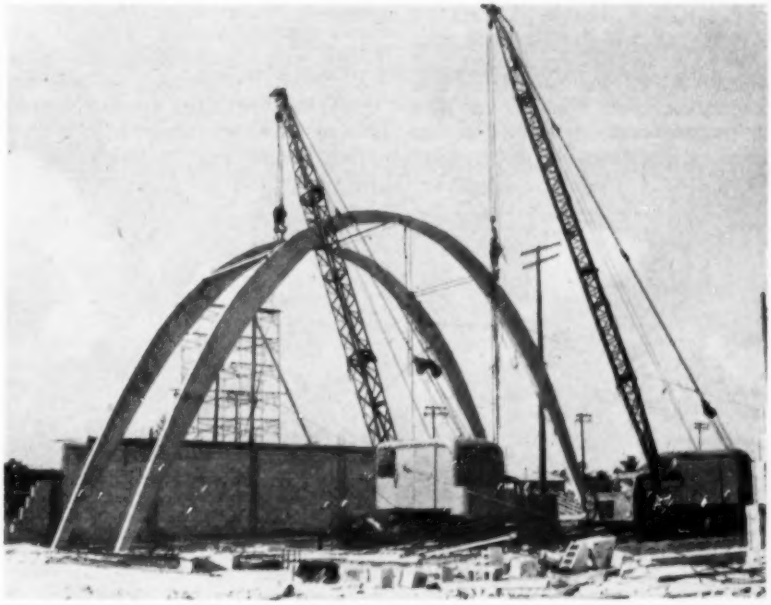
Materials used in the mix are Lehigh high-early-strength cement, oölitic limestone screenings, and coarse oölitic limestone with a top size of 1 in. Because the frames pass entirely through the walls in which they are installed, a very dense concrete is considered essential, and consequently a very rich mix is used.

The storage plant is an Erie Steel



Large precast concrete window frames in this attractive school building achieve a striking shadow-box effect.

The attractive rail fence pictured here consists of precast concrete posts and rails produced by Livesay.



Huge two-section parabolic arches, shown here in the process of erection, were cast in the Livesay plant.

Left: Here a workman is spraying the interior surfaces of one of the pressed steel molds just before it is transported to the pouring station.

Right: With the mold supported on the forks of a lift truck, workmen handling two rubber hoses direct the flow of concrete from a balcony-mounted mixer.

Construction installation which incorporates an 800-bbl. cement silo and a 2-cu. yd. weigh batcher. Mixing is done with an 18-cu. ft. batch mixer located on a balcony which overhangs one end of the casting floor. This unit discharges into a shallow double hopper through which the concrete flows into the rubber hoses used for filling the forms. An air vibrator attached to the throat area of each hopper section speeds the flow of the material.

The pouring operation is simple, speedy, and efficient. A lift truck carrying an empty form at convenient working height on the forks swings under the mixing balcony. While two men manipulate the hoses to fill the form with concrete, two others drop in prepared sections of reinforcing steel as required. The operation is completed in less time than it takes to describe it, the form is struck off, and the lift truck pulls away to make room for another unit which is usually waiting to move into pouring position. The present fleet of lift trucks consists of four Hyster units and a recently purchased Ross-Carrier machine.

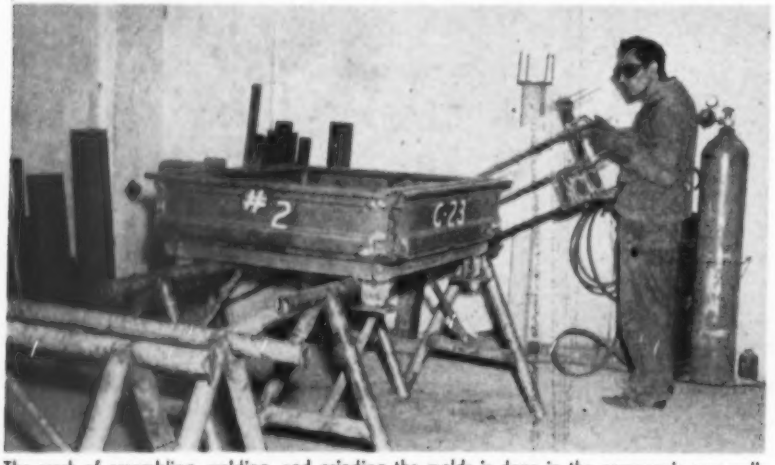
Soon after they are poured, the forms are stacked and moved into rooms adjoining the casting floor, where the concrete is cured for 1½ to 2 hours with live steam. There are three separate rooms for this purpose, and the ceilings are high enough to permit stacking the molds eight high. Steam is supplied by an oil-fired Kewanee boiler.

The primary purpose of the steam curing cycle is to expedite the reuse of the steel molds, the two-hour cycle providing sufficient strength to permit stripping the units as soon as they are removed from the steam rooms. Thus it is possible to average at least three cycles of production with each form during a 10-hr. work day, and on certain standard sizes four uses per day is not uncommon.

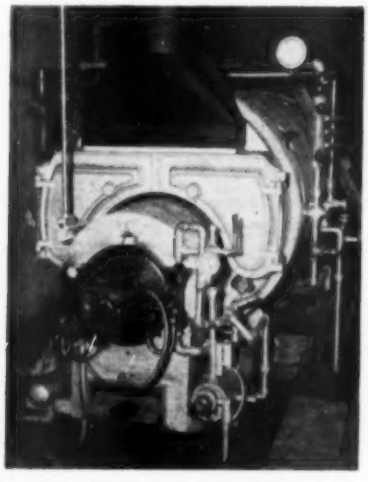
The foregoing production cycle applies to the manufacture of what the company regards as standard-size frames for steel and aluminum casings, and the jalousie- and awning-type windows which are coming into wide use throughout Florida. At present approximately 250 molds are on hand for manufacturing such frames. Very large frames, for which there is less demand, and which also pose special handling problems, are made with adjustable steel molds on a casting slab located outside the plant building. After they are poured, these units are covered with tarpaulins and cured with live steam introduced through hoses. Wooden cross braces are bolted into these units, as well as into some of the larger standard frames, to stiffen the members so that they can be moved immediately after the forms are stripped. Frames have been made on special orders up to a maximum of 15 ft. square.

Livesay precast concrete frames have filled an important need in a section where the exterior walls of practically all types of structures are built of concrete masonry units, and where the climate is definitely antagonistic to wood frames and supports. In addition to providing a permanent, decay proof material for framing openings, the concrete frames quickly gained an enviable reputation for providing far superior protection against wind-driven rain.

When it became clear that properly installed precast concrete frames eliminated leakage around windows, lending agencies quickly took cogniz-

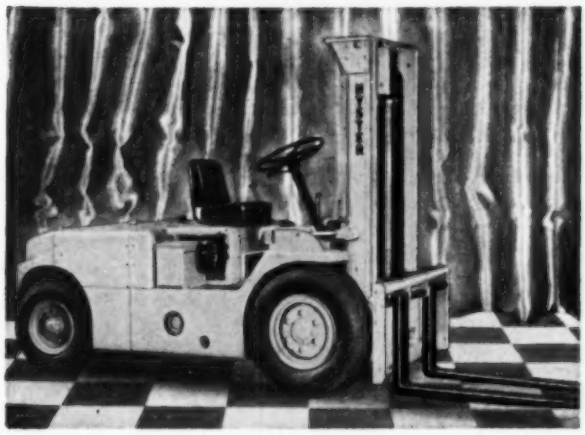


The work of assembling, welding, and grinding the molds is done in the company's own well-equipped shop.

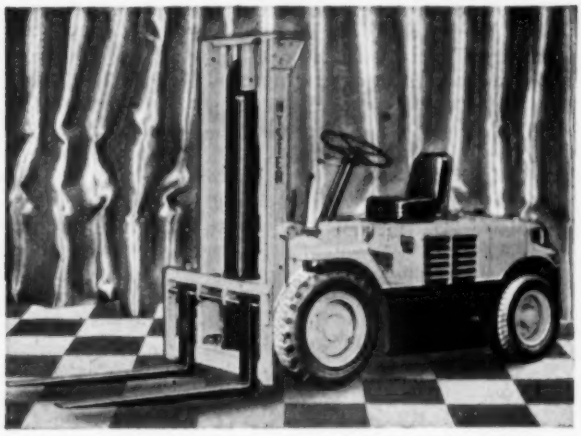


Steam for the very short cycle of curing is supplied by this oil-fired boiler.

FOR HANDLING MATERIALS UP TO 6000-8000 LBS....INSIDE OR OUTSIDE!



HYSTER ZA-80 (8000 lbs. capacity) is the ideal *"Outside-Inside"* Truck. Long in wheelbase, but short in over-all length—for smooth riding and high maneuverability. Has tremendous traction.



HYSTER XA-60 (6000 lbs. capacity) is the ideal *"Inside-Outside"* Truck. *Shorter, narrower* than any other 6000-lb. lift truck. It permits great maneuverability inside. Pneumatic tires are easy on floors, give greater traction outside.

2 HYSTER
PROFIT-MAKING CHAMPIONS

Educated Horsepower pays off in your plant, too. Hyster specializes in the educated horsepower that you can put to work in winning *greater* profits for your business!

The new Hyster XA-60 and ZA-80 Lift Trucks, for example. In its respective range, each offers more *usefulness*, more work *capacity*, more *versatility* than any other lift truck today! They make possible carrying out the latest, most efficient schemes in materials handling. Each of these two trucks often make it possible for a plant to operate *one* truck in place of *two!* Each can be operated efficiently inside *and* outside! Ask your Hyster Dealer for a demonstration, or write for Catalogs 1230 and 1231 to:

HYSTER COMPANY

2926 N. E. Clackamas St.
Portland 8, Oregon

1026 Myers Street
Danville, Illinois

Be Sure to Call HYSTER
Before You Buy ANY Lift Truck!

THERE'S PROFIT IN
HYSTER
POWER

HYSTER COMPANY • FOUR FACTORIES: PORTLAND, OREGON; DANVILLE, ILLINOIS; PEORIA, ILLINOIS; NIJMEGEN, THE NETHERLANDS

ance of this fact by allowing more money for projects on which the Livesay units were specified. Real estate firms soon lent additional impetus to the whole development by noting in their advertisements the superior performance of homes incorporating concrete frames. According to the company, the frames also effect a tangible saving in the initial net cost of virtually all types of structures. One source of economy is the elimination of clean-up expense, since with the concrete frames there is no need to install casements until all stucco and plaster work is completed.

In order to be sure that all of the workmanship which affects the performance of its product is of the same high caliber maintained in plant manufacturing operations, the company has its own crews for setting frames and installing casements. It also operates its own fleet of 13 delivery trucks for shipping frames to points as far away as Jacksonville. By careful planning and scheduling, each delivery is timed to reach the particular job for which it is intended when the exterior walls are sill high, so that the frames can be set up and plumbed immediately. Then the contractor brings the walls up around the frames, and when the exterior stucco and interior plaster have been applied, a Livesay crew returns to install the casements and do the final caulking.

Except for extremely large units, which are handled by cranes, most of the frames are set manually by the four men who comprise a typical installation crew. Regardless of size, all frames of a given type consist of standard sections comprising sill, jambs, and headers, but the amount and size of reinforcing steel varies with the dimensions of the unit. The sections which form standard frames average approximately 17½ lbs. per lineal ft. Although residential and apartment buildings have comprised a large share of the firm's market to date, schools, hospitals, and other institutional structures are an increasingly important factor in the present sales picture.

Ever alert to new opportunities in its field, the Livesay organization has developed a number of special frames for the installation of various types and sizes of air-conditioning units. By setting these units in the walls of new buildings, provision is made for the operation of air-conditioning equipment without the unsightly window installations formerly required. Frames of this type must be engineered for each particular make of equipment, but production methods and equipment are the same as for window frames.

The company is willing and apparently well able to tackle virtually any sort of job in the field of precast concrete. Not long ago, for example, it was awarded the contract for precasting five two-section parabolic arches for a gymnasium project in the Miami area. Although most of the personnel lacked previous experience in work of this type, the 8½-ton units were cast, delivered and erected entirely without incident.

Livesay also precasts posts and rails used in the erection of exceptionally attractive concrete fences, and turns out a considerable number of such comparatively simple items as stepping stones, bench ends, and clothes posts. All of these activities are carried on in an open yard across the road from the main plant. Concrete used at this location is placed in wheelbarrows at the pouring station described earlier, and moved to the casting yard by hand.

Right: One of the lift trucks entering a steam curing room with four freshly-poured molds.

Very large frames are poured on a slab outside the plant building, covered with canvas, and subjected to about two hours of curing with live steam.

Such items as precast fencing, stepping stones, bench ends, and clothes poles are cast in an open yard adjacent to the plant building.

How to Merchandise Concrete Blocks with Experience Stories

another P-Q exclusive

ANY one of our readers who make concrete products would have enjoyed the visit we had with Dick Francis, founder and spark plug of Greater Cincinnati's largest producer . . . Reading Concrete Products Inc. He has plants at Reading and Miamitown, Ohio, and has just opened a new plant at Newtown . . . with an hourly capacity of 3,600 blocks for all three plants. Starting from scratch with a single-block tamper with a capacity of 1,800 units a day in 1947, he has built a million-dollar business. While the industry has increased production 65 percent, Mr. Francis has increased his company's production 1,500 percent.

Asked for the reasons, Mr. Francis turned to the Reading samples on display in his office and said: "First of all, we strive for uniformity of every machine-made concrete unit . . . load after load. That's important. Most jobs take several loads . . . or many loads, such as the more than a million units for the interior walls of the new office building and plant of the General Electric Company. Every move we have made in the plant has been aimed at the same shape, size, texture, color . . . time after time. The architects, contractors, and dealers now recognize this Reading Rock merit."

Reading uses all Besser equipment . . . three "3 at a time" units and a "6 at a time" which has been operating three years. The company is planning on putting another "6 at a time" at the Newtown plant.

Next Mr. Francis took out a photograph of his rolling equipment fleet and pointed to a tandem: "Other producers called me crazy to put $9,000 into this unit. But it has substantially reinforced our claim that we get through, regardless . . . whatever the weather or the soil condition at the site. Some contractors point to time saved because whenever they order, the blocks are delivered next morning."

When we learned that for weeks last winter the Reading plants were pushed to produce more units than any time since the business ws founded, we asked for an explanation of this unseasonable bulge. Mr. Francis brought out a scrap book of newspaper advertisements, TV and radio scripts, and said: "The 11th of last August our ad in the crowded real estate section of the Cincinnati *Enquirer*, with about 250,000 readers, started a new chapter in our business . . . advertising. Before this time we had confined our investment in goodwill messages to the yellow pages of the telephone book and well-selected remembrance presents. Since August, as you can see, every week we've had, not one, but several ads in one or more of the three media. So far, we believe, newspaper advertising produces the best results.

"Results? Well, that's a little hard to measure with a yardstick. Our business was really rolling before we started to advertise. But we believe that advertising has put some extra cream on top of the milk. And we consider this, plus investment in good will, just as good business as to build up an inventory . . . say, of machine parts.

"Perhaps the best way to answer you is to give you a few straws in the wind. Hamilton is almost 20 miles to the north. One morning the phone rang and the man in charge of building for a factory there said our advertising had put him on the spot. The top brass asked him if he knew anything about this better block down at Cincinnati. He had to plead ignorance. He wasn't ignorant long, however, and we got a nice order for a new plant.

"Then we had comments from practically every dealer and contractor with whom we do business, so we knew they were reading the ads, or seeing TV broadcasts, or hearing the

● Ads like the ones below and on page 270 have a powerful pulling capacity, with their pictures and stories of local product applications.

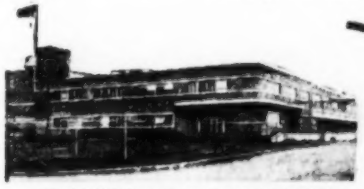
OWNER, THE U. S. GRINDING COMPANY ● MADEIRA
GENERAL CONTRACTOR, DEWEY DAMEN

"none out of square in 5 years"

● Contractor Damen with that five-year experience told why he and Production Manager Hilliard Dozier selected Reading Rock . . . *the Quality Block* . . . for this new plant out in Madeira. Mr. Damen says also that Reading Rock keep their machines in good repair to maintain true blocks. That makes it easier to lay them true. This contractor also reports that Reading Rock is a harder block . . . and he ought to know after five years. That's because its formula is maintained . . . and it's steam-cured for permanence. When you build get the facts about all of the advantages of Reading Rock . . . *the Quality Block*. Reading Concrete Products, Inc., 1773 Reading Road, Reading.

demand the choice of "professionals"

READING ROCK
The QUALITY BLOCK



OWNER, CROSLEY DIVISION ● AVCO MFG. CORP. ● ELMDALE
GENERAL CONTRACTOR, FERRO CONCRETE CONSTRUCTION CO.

Crosley likes true blocks

● Both owner and general contractor agreed on Reading Rock . . . *the Quality Block* . . . for this new plant making equipment for the government. Their reasons will impress every Cincinnati builder: a good block with true dimensions . . . made to the highest standards . . . with the texture uniform. Ferro Concrete mentions the splendid service for which Reading Rock has long been known. Their building time table is never upset by late deliveries. And time means money!

● More and more, builders are taking note of the general preference of "professionals" for Reading Rock . . . *the Quality Block*. For all the benefits phone VAlley 3564 . . . Reading Concrete Products, Inc., 1773 Reading Road, Reading.

for steam-cured permanence . . . demand

READING ROCK
The QUALITY BLOCK

radio spots. Most of our competitors showed they were conscious of our advertising, too. All in all, we know our ads are being read and heard, and we also know that business is better. As matters stand now, the chances are our advertising investment will be increased, since our capacity has recently been increased more than 30 percent."

Then Mr. Francis started to show how he had whipped the problem of getting attention in the crowded pages of a thick Sunday newspaper and from the jaded TV and radio audiences. "It all boils down," he said, "to one simple practice. Don't make empty claims. Build your ads and scripts around customer satisfaction and quote the customer. The Reading ads reproduced on these pages show the application of this principle."

The following script for a one-minute announcement is fairly typical of Reading's radio advertising, and provides a good example of a tie-in with a newspaper ad.

That picture in the *Enquirer* real estate section Sunday of the Lodge & Shipley reception room reminds me of a story about Reading Rock you'll be interested in.

The reasons Brockmann & Son Inc., masonry contractors, had Cincinnati Builders Supply Company deliver Reading Rock . . . the Quality Block . . . to this building are important . . . particularly where you use these machine-made concrete units for interior walls. . . . The texture is more uniform . . . not one coarse and then one fine . . . they're all the same. As Gil Brockmann said: "They adhered to the sam-

HOME OF MR. AND MRS. BRUCE W. BROWN • 810 WOODBINE • GLENDALE
ARCHITECT: A. C. DENISON
CONTRACTOR: WM. LICHTENBERG SONS

adds beauty to Glendale home

• When you drive by this modern home, you'll see why the owner specified Reading Rock . . . *the quality block.* It's *steam-cured.* Made right . . . it actually improves with age. It has all of the economies of ordinary concrete masonry units . . . plus the Reading Rock extras. More sizes and shapes simplify construction. Reading Concrete Products, Inc. 1773 Reading Road, Reading.

the best costs no more . . . so demand

READING ROCK
The QUALITY BLOCK

OWNER: Woman's Division of Christian Service, Literature Headquarters, Board of Missions, Methodist Church.
ARCHITECTS: GRUNSFELDER & SULLIVAN
GENERAL CONTRACTOR: LEIBOLD-FARRELL BUILDING CO.
MASONRY CONTRACTOR: BROCKMANN & SON, INC.

uniform shape and texture

• On the exposed interior walls and the exterior walls of other than the office front of this attractive, efficient Methodist structure out on Reading Road just beyond Howard Johnson's you'll find Reading Rock . . . the *Quality* Block. Masonry Contractor Gil Brockmann asked for it so he would not have to contend with different colored blocks on different loads. He says his experience shows Reading Rock is also uniform in shape and texture . . . "makes a prettier looking job." Where you don't plaster, texture and trueness are important. Find out why more and more "professionals" ask for Reading Rock. Reading Concrete Products, Inc., 1773 Reading Road, Reading.

for thrifty permanence . . . demand

READING ROCK
The QUALITY BLOCK

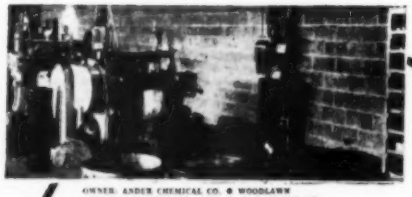
OWNER: BURKE CO.—BOND HILL

how variety helped design

• One of the reasons why Al Nurre Jr. picked Reading Rock for their office building . . . the choice of hundred shapes and sizes made unified design and beauty possible. Reading Rock gave structural strength. It was economical. More and more builders and their architects are insisting on the many advantages that only Reading Rock can give . . . *the Quality Block that actually improves with age.* Reading Concrete Products Inc., 1773 Reading Road, Reading.

the best costs no more . . . so demand

READING ROCK
The QUALITY BLOCK



OWNER: ANDER CHEMICAL CO. • WOODLAWN
GENERAL CONTRACTOR: THE J. A. E. WARM CO.
MASONRY CONTRACTOR: A. E. BECKMAN INC.

"densest block we could find"

• Ander Chemical makes ink. Color is in the air. Porous blocks would catch color . . . then be unsightly. President George Nieder personally checked every block offered in the Greater Cincinnati market. He picked Reading Rock because it had "*the tightest texture*" . . . for both backup and interior walls for their new office and four plants. He also appreciated the reason Contractor Beckman wanted Reading Rock . . . delivery the next morning when they needed it . . . no wasted time . . . lower building costs. Contractor Warm adds: "Better quality . . . uniformity . . . better looking walls." Reading Concrete Products Inc., 1773 Reading Road, Reading.

demand the longer life of

READING ROCK
The QUALITY BLOCK

ple block they submitted. Reading Rock is a nice true block . . . true shape . . . true size."

As President William L. Dolle of Lodge & Shipley says: "We are very pleased with the Reading Rock on the interior walls of the new Administration Building. This includes the reception room, executive offices, general offices, engineering department, and the cafeteria."

Plant Engineer Kenneth Phillips liked the light color of Reading Rock. By stacked bond . . . vertical joints . . . he has built-in conduits. These have paid off several times since the building was erected. They avoided unsightly exposed wiring.

Beauty . . . permanence . . . economy . . . no change in price in the last 2½ years.

Friends, what can you get so much of . . . for so little . . . that lasts as long as . . . Reading Rock . . . the Quality Block?

If you can not reach your building supply dealer now . . . and leave for work early, phone VAlley 3564 and ask for Dick or Jim . . . WIllow 0700 and ask for Ray or Bill. Both Reading and Miamitown plants open at 7. Saturdays they're open until 4:30 to answer any Reading Rock questions you may have.

A typical Reading television 90-second spot announcement may call for the following visual material: Regular concrete block . . . three-quarter view . . . texture side out. Photos of various commercial buildings, and logotype and phone-number cards. The following is an actual TV script:

> As we were saying a while back on this program, this last Saturday of the year is a good time to take stock of all the good things we have been telling you about Reading Rock . . . (hand on block) . . . the *steam-cured* Quality Block. We have talked a while ago about the reasons why home-builders choose Reading Rock. Now let's sum up the Reading Rock story for the commercial building owner and architect. As you know, we don't make claims. We show you installations and the why in each case.
>
> Take for example this plant (show photo) and office building of the General Electric Company out at Evendale . . . here's more than a million units of Reading Rock . . . the Quality Block (logotype card). Actually, this jet operation would have been crippled if they had chosen ordinary building materials . . . they were not to be had. But always . . . like the mails . . . in snow and sleet . . . etc. . . . Reading Rock delivers. Another thing, these Reading Rock make beautiful exposed interior walls!
>
> The same reason dictated the use of Reading Rock . . . more than a quarter million of them . . . for the exposed interior walls of this United States (show photo) Public Health Service Building out overlooking Columbia Parkway.
>
> For many reasons of economy, permanent beauty, low upkeep, low insurance rates, termite-free, rodent-free, fire-resistant, structural economies and unified design . . . here are other buildings in Greater Cincinnati that prove the preference for Reading Rock . . . the Quality Block . . . Shur-Good Biscuit Company (show photo), Co-Operative Mills (photo), Sawbrook Steel Castings Company (photo), Sealtron Company, Maxwell Company's freight warehouse (photo), and the beautiful office building of The Nurre Company, well known building supply dealer (photo).
>
> To get all of these enduring values in your new business building, phone (phone number card) VAlley 3564 or WIllow 0700 for the name of your nearest building supply dealer. He'll be glad to show you the way to use the hundred sizes and shapes of Reading Rock for most economy and thrift. He can deliver all you need . . . when you need . . . no delays.
>
> Just think . . . 20 cents a block, delivered anywhere in Greater Cincinnati!
>
> What can you get so much of . . . for as little . . . that lasts as long . . . as Reading Rock . . . the Quality Block.

The same user stories sparkle in practically every radio and TV script. The added feature . . . mention of the building supply dealer who delivered the blocks to the job . . . explains why Dick Francis has a lot of building industry "professionals" on his team.

As the first president of the recently chartered Ohio Concrete Block Association, we understand that Mr. Francis is going to put a new "show" on the road as soon as he gets his Newtown plant running as smoothly as the Reading and Miamitown units. Probably every one of the Ohio local chapter members will see the whole exhibit of the Reading Rock campaigns and in open forum can get more details on how the advertising functions for him.

We hope that other aggressive concrete product manufacturers who are doing a similar advertising job will send us samples so that we can make this the first of a series on merchandising this fast-moving building material as if it were soap or corn flakes!

Block Makers Visit—

(From page 258)

ers Supply Corp. at Ashfork and Williams, Ariz., which are about 200 miles north of the plant in Phoenix. The cars at the plant are moved and positioned by an electric car mover installed at the rail siding. An entire car of material can be unloaded and processed in 30 minutes.

Finished material is then conveyed to the main batching plant by means of long conveyors. On the mezzanine floor of the batching and mixing section, the group saw seven 50-cu. ft. mixers in operation. The various batches are made up in an electric traveling dory which feeds all seven of the mixers. Two men batch all mixes and completely operate the batching department. The mixed aggregate is dumped into hoppers directly over the Super Vibrapacs and the Lintelator, feeding by gravity into the machines.

The off-bearer for each machine fills two racks on each side. The visitors saw how two standard racks had been welded together, end-to-end, and how the beds of the Elwell Parker low lift platform trucks had been lengthened so as to pick up these two racks at a time—another cost-reducing idea. Another feature for lowering manufacturing costs was demonstrated when the visitors saw some new Yale fork trucks pick up two standard cubes at a time to carry them to the storage yards. Of interest at this point was the fact that in the storage yards at the Builders Supply plant one could see 4,500,000 blocks cubed and stacked, waiting for proper aging before delivery. Each cube is marked with the shift number and date of manufacture.

One idea the visitors picked up was the method of holding together cubes made up of small pieces such as sill blocks, half blocks, or assorted small blocks. This is accomplished

by placing a sheet of paper between every other row, or layer of blocks. If the blocks are stored out of doors, subject to the weather, it is better to use a water-resistant kraft paper.

A very interesting session was held in the Builders Supply laboratory at the plant. Under the direction of George G. Olson, the visitors were shown various experiments and tests being made on various aggregates, binders, admixes, and formulae. Many questions were asked and answered regarding design mixes, shrinking, moisture absorption, etc. After the trip through the laboratory, the visitors had a preview of a new block cubing machine under development at the plant. This new machine has been designed to push the blocks automatically off the racks after curing and to stack them in standard cubes ready for the stockpile. The automatic cuber will cube all the blocks six Besser machines can make.

The tour continued through the mezzanine floor, where the guests saw the traveling batchers feed seven 50-cu. ft. mixers from one central batching position. The group was conducted through the machine and repair shops where the mold boxes are re-built, where the fork trucks and low-lifts are overhauled, and where the repair parts are kept ready for any emergency.

The new Superlite Unloader was the most outstanding demonstration, according to the comments of the visitors. A fleet of trucks equipped with Superlite Unloaders was very impressive. One truck proved, by demonstration, that 1,080 8- by 8- by 16-in. blocks can be unloaded in 20 minutes or less. The Superlite Unloader was designed and perfected by Builders Supply Corporation and is being manufactured by their affiliate, the Builders Equipment Company.

After the plant trip the group was taken in chartered buses on a tour of the various housing and building projects in Phoenix, to show the visitors the many beautiful and effective ways blocks may be used in construction. After viewing several tracts of lower-cost Superlite block homes, they were also shown many of the larger homes in Phoenix built of Superlite blocks.

Finally the party was taken to the Desert Inn about 5 p. m. for a swim in the pool. The entire group, with their wives, were the guests of the Builders Supply Corporation at a dinner and cocktail party held at Newton's Prime Rib, one of the finest eating establishments in Phoenix.

Among those present on this special trip were the following: William A. Warringer, C. D. Roberts, and C. D. Bishop, all of the Riverside Cement Co., Los Angeles; Les Naumann, the Robert H. Braun Co., Los Angeles, Clark fork lift truck distributors; Ralph G. Bailey of the Besser Mfg. Co., Alpena, Mich.; and Charles Stevens of the Gene Olsen Corp., Adrian, Mich.

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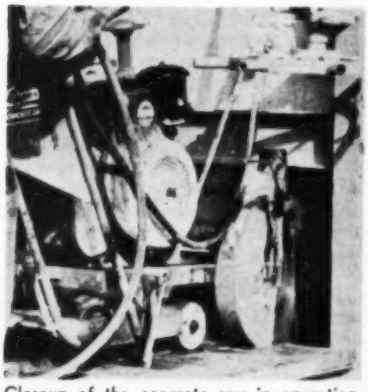
Exemption from Renegotiation Sought for Ready-Mix Industry

On April 30 the National Ready Mixed Concrete Association was represented by its legal counsel, John Sapienza, Vincent P. Ahearn, executive secretary, and Stanton Walker, director of engineering, at an informal hearing before Lawrence E. Hartwig, member of the Renegotiation Board. The basis of the association's appeal for exemption from renegotiation of the ready-mixed concrete industry's contracts was set forth in a supplemental petition.

Action on the association's first application for exemption was deferred because members of the board were at that time attempting to determine which industries were covered by the mandatory exemptions in the Renegotiation Act of 1951. The association's case is now under consideration.

Saw on Platform Winch Does Vertical Cutting Job

In order to tie in new construction with an existing structure, a Rockford, Ill., contractor recently made use of a conventional concrete saw to make a vertical cut in a concrete wall. The vertical cut was made possible by placing the saw on a winch-operated platform, which was used to raise the saw and the operator as the work progressed. Only a simple adjustment of the guard in order to expose the front edge of the blade, rather than the lower portion, was required for this unusual procedure.



Closeup of the concrete saw in operation. The winch used for raising the platform is visible above the saw blade.

View showing how the saw cut confined the breaking of the concrete, leaving a smooth corner post to be used as an anchorage for the new construction.

The wall was cut to approximately one-fourth its depth, and the entire saw was moved upward by the operator, using the winch to raise the platform. The sawed line confined the breaking of the concrete, leaving a smooth, neat corner post as an anchor for the new construction. The machine used in the work was a model C-130 Clipper "Consaw".

The following have been added to the sales force of Salina Concrete Products, Inc., Salina, Kans.: Wayne Fender, concrete block and other construction items; Dean Stover, related items; and Ted Peterson, silo building materials. Flavel Simcox, formerly sales engineer, will handle quotations for the firm at Salina.

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- Never Rot, Rust, Warp or Swell
- Lifetime "Ventiseal" Glazed—No Putty Problems—Yet Easy to Replace Glass
- Storm Sash and Screens Easily Hung, Removed and Stored

Check the yellow pages—

If you don't find PER-FIT and BEST-VENT Windows listed in your telephone book—we may still need an aggressive dealer in your area—tell us about your company; we'll gladly tell you about ours.

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Manufacturer of the World's Finest Windows

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1201 East 52nd Street, Indianapolis 5, Indiana

Many Concrete Firms Expand Facilities, Build New Plants

At Terre Haute, Ind., the new building of the G. A. Monninger Concrete Products Company was recently completed. The structure houses the office, display room, and warehouse. A new wing is under construction for the firm's big Besser Super Vibrapac block machine, which will turn out 8- by 8- by 16-in. units at the rate of 900 per hour.

Production of 125 tons of asphaltic concrete per hour will be possible at the Champaign Asphalt Company, Champaign, Ill., with the completion of a new plant. The new installation, a Hetherington-Berner unit, is twice the size of the one it has replaced. Controls will be hydraulically operated. William P. Lynch is superintendent of the plant.

The Cameron, Mo., branch of the Bethany Falls Transit Mix Concrete Company now has a new $10,000 60-ft. steel bulk cement tank, together with a hopper and scales. Haydite and standard concrete block made at the Bethany plant will also be handled at this location. K. O. Kinnison and Al Linville are the owners of the company, and Richard Taylor manages the Cameron plant.

Washington Concrete, Inc., is the name of a new concrete products firm organized at Washington, Ind., by Breidenbaugh Bros. of Jasper, Ind., who bought the land and facilities of the Humbarger Transit-Mix, Inc., in Washington. Building and expansion plans are now under consideration, and the newly-acquired facilities will be completely modernized. Mixing units from two other Breidenbaugh plans will be transferred to assure adequate service at the new operation. Arnett Breidenbaugh, a member of the parent organization, will serve as general manager at Washington.

At Moses Lake, Wash., owners of Evertru Products, Inc., recently installed a 20-ton Besser Super Vibrapac which will boost production from 3,000 to 6,000 units per day. Two-core block will replace the three-core type formerly produced at this plant.

James J. Igoe has opened a sizable ready-mixed concrete plant at Bismarck, N. D., which can turn out 110 yds./hr. Mr. Igoe has headed the Igoe Construction Company in this city since 1945. The plant, which occupies a square block, has a total storage capacity of 1½ carloads of cement.

Plans for an open house are under consideration by the management of the Empire Building Material Company, Portland, Oreg., for which an office building has just been completed. The modernistic structure is built largely of the firm's products, including Lite-Rock expanded shale block, soffit tile flooring and a roof of concrete shingles.

Work on Prestressed Concrete Presents Concentrated Data

In *Prestressed Concrete*, a 470-page reference volume, the author, Dr. Kurt Billig, attempts to provide in concentrated form all the information available on the subject. Part I deals with general data and fundamentals, including history and development, specification of materials, various production processes and types of structures, and typical examples.

Part II deals with the design of prestressed concrete structures under the following heads: notations, basic principles and assumptions, various loading stages, losses in prestress, bond and end anchorages, diagonal tension, continuity, deformations, resistance to cracking, ultimate strength, and the safety coefficient.

Part III covers design problems and includes numerical examples, such as eccentrically prestressed I-joists and box girders, uniformly precompressed joists, a girder bridge and a slab bridge, a radio tower, shell roofs, etc.

Published simultaneously by D. Van Nostrand Company, Inc., New York, and D. Van Nostrand Company (Canada), Ltd., Toronto. Price, $9 per copy.

Standard Concrete Pipe Co. Operated by L. F. Brown

Concrete pipe in diameters from 4 to 24 in. is being produced on a Martin Model 19-48 packerhead machine in the Standard Concrete Pipe Company's new facilities at Lubbock, Tex. The firm makes pipe and installs underground irrigation systems. Its plant occupies a building with 18,000 sq. ft. of floorspace.

This industry, which began operations in March of this year, employs 40 men. President of the company is L. F. Brown, who was formerly associated with the Gifford-Hill Company of Dallas, Tex.

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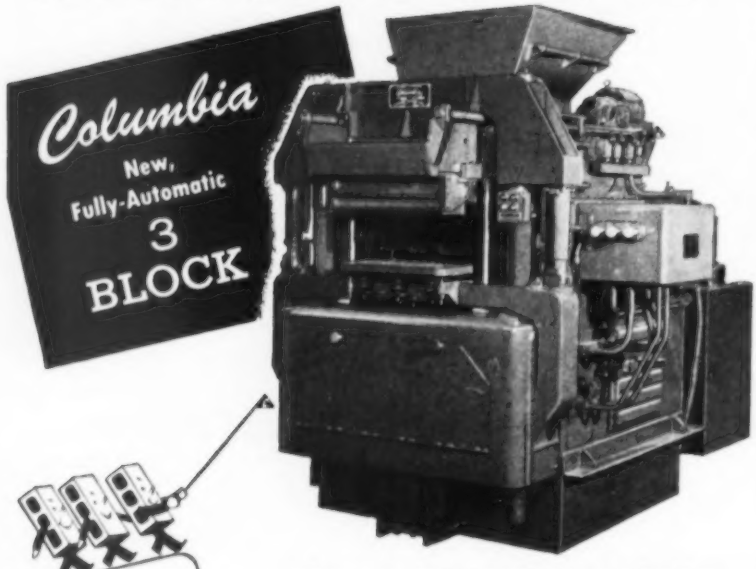

...gives you fast, profitable production of quality blocks on a low cost basis!

Columbia's rugged construction, precision tooling, concealed parts, keep maintenance costs down and step-up production standards to a new, profitable high! Here are more reasons why Columbia's new 3-block machine gives outstanding performance: Standard Plain Pallet • Removable Plunger • Controlled Vibration • Hydraulically Operated • Manual Controls for Clean-up • Automatic Height Control • Twenty-Minute Mold Change. These and more make Columbia the leader in its field!

NATIONWIDE SALES, PARTS AND MAINTENANCE SERVICE with headquarters in the following states: Washington, California, Wisconsin, Ohio, Mississippi, New Jersey, Florida, South Carolina, and Virginia. Fast service maintained to all parts of the country. Write today for additional information.

Columbia LINE MACHINES FOR THE BLOCK-MAKING INDUSTRY

- Fully automatic and manual block making machines, 2 and 3-block capacities.
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Yours FREE! Write for new catalog of the Columbia line.

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Trade Literature

The Ideal Building Material, an interesting treatise on the development of cellular concrete, gives special attention to the aerated calcium silicate hydrate product "Calsi-crete". Using the "preformed foam" process, this product can be made with raw materials abundant in nearly every part of the nation. Considerably lighter than conventional lightweight concrete, it has many attractive structural features. Calsi-crete Corp.
Our Identification No. 101.

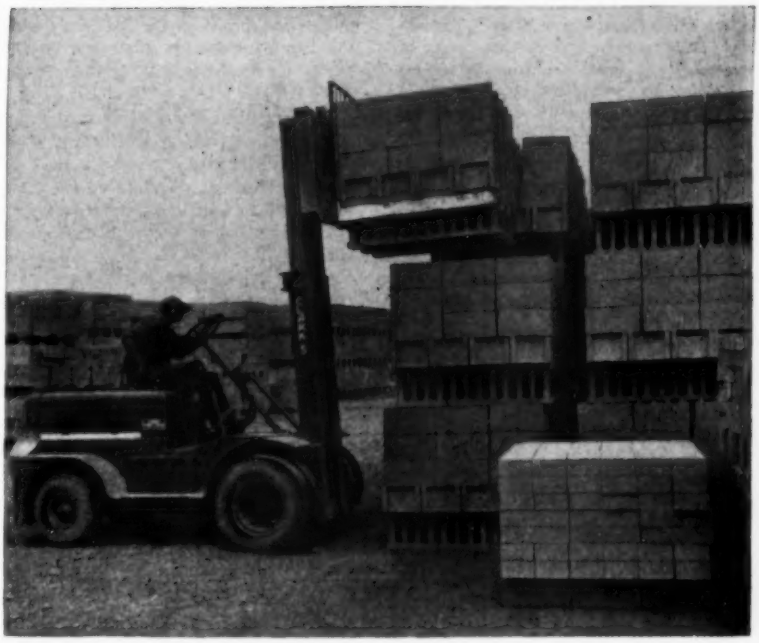
Ceramic Glazed Concrete Block. This four-page folder illustrates and describes a method of glazing concrete block with a ceramic glaze that is vitrified onto the block in a kiln. A concrete block drier is also described. This folder is designed to acquaint the prospective user with recent developments in these fields and to solicit specific inquiries about them. Ferro, Allied Engineering Div.
Our Identification No. 102.

Burmeister Tilt-Up Mixers. Bulletin 19525. The sixteen pages of this bulletin cover features of 3 and 4 cu. yd. tilting mixers, semi-portable plants, dry batch plants, semi-portable bulk cement plants and bins, 3-compartment and standard aggregate bins, elevators, bin gates, valves and bottoms, screw and belt conveyors, and plant installations. Dimension drawings are shown for most of the equipment covered while the brief text explains features not shown by the drawings or photos. L. Burmeister Co.
Our Identification No. 103.

Your Boiler is Obsolete Unless You Can Cure in Two Hours. The four pages of this folder present the advantages of a boiler that is designed to produce steam for concrete curing purposes. Several testimonials are given and the dimensions of the unit are tabulated. Burkhart Engineering Association.
Our Identification No. 104.

Bickerstaff Block Forks. This folder uses photos to show the use of the fork truck in handling cubes of concrete block. Picking up cubes without pallets, stacking, loading and preparation of cubes are illustrated. The text is limited to a few brief headings. The forks are equipped with automatic grippers that hold the block when the load is applied to them. Bickerstaff Inc.
Our Identification No. 105.

Duoblock Senior. This sheet shows a two block machine and gives specifications and claims. Features of the machine are pointed out, and the operation is described. Duoblock Division, International Selling Corporation.
Our Identification No. 106.



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There's no secret about the shortage of dependable yard labor. Likewise, there's no secret about the way smart dealers are eliminating that headache: 6 out of 10 report plans to mechanize their handling operations.

Which is where CLARK comes into the picture—with a complete line of both pneumatic and cushion (or solid) tired fork trucks in capacities of 1000 lbs. to 15,000 lbs., with POWR-WORKER hand trucks and towing tractors. CLARK, the world's largest manufacturer of industrial trucks, has experienced dealers throughout the country. They're qualified to serve you—to help you plan a mechanized handling system, to provide complete service facilities for your equipment, and of course to supply you with the right equipment from the CLARK line.

Look for the name of your local CLARK dealer in the Yellow Pages of your 'phone book, under "Trucks, Industrial." A brief talk with him will indicate a fool-proof way to beat the labor shortage. Call him today—or use the coupon below.

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AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

The Little Giant Crane, Shovel, Trenchhoe. Catalog 153. The sixteen pages of this catalog present the history, construction, features, and attachments of a ½ cu. yd. and a ⅜ cu. yard shovel. Photos show action views of the different mountings and attachments. The features of the machines are described and summarized and specifications are included. Little Giant Crane and Shovel, Inc.
Our Identification No. 107.

Here's What Trabon Centralized Lubrications Systems can do for you. Bulletin 529. The four pages of this loose-leaf insert folder show two systems for lubricating bearings. Diagrams show the distribution systems and the text explains the features of each. Types of lubricant pumps are shown on the back page while the front summarizes the major advantages of a centralized lubrication system. Trabon Engineering Corp.
Our Identification No. 108.

Dustfoe #55 Respirator. This folder uses illustrations to present a dust respirator. Construction features are shown in exploded views and the value of each is explained in the text. Sketches show cleaning and filter changing procedures. Mine Safety Appliances.
Our Identification No. 109.

How to Build a Form With Gates Concrete Form Ties. Brochure G-2. The 32 pages of this pocket size booklet contain drawings showing the details of form construction using form ties. Such points as starting, rodding, stripping, corners, studs details, hardware, layout, and many others are covered. Illustrations of actual use are shown on the front cover. Ties for both board and plywood forms are included. Gates and Sons.
Our Identification No. 110.

Oil-Mist Automatic Lubrication System. Form 22-185. A system of lubricating all types of bearings is presented in the 12 pages of this booklet. Drawings, sketches, and diagrams show the features of the system, its installation, and function. Operation, and advantages are covered. Models and accessories such as nozzles and fittings are shown. Alemite Division of Stewart-Warner.
Our Identification No. 111.

Products of Fuller Company. GDM-13. The illustrations in this four-page folder show typical installations of products manufactured by the company. The text explains the various products made. Included are conveying systems, Airslide, Airveyor, compressors and pumps, coolers, feeders, valves, level indicators, aeration units, etc. This equipment is used for conveying and controlling dry pulverized, crushed or granular materials. Fuller Co.
Our Identification No. 112.

Split Rock, for homes of lasting beauty. Full color illustrations of beautiful homes fill the 12 pages of this large booklet. Close-up details are included to show colors and styles of walls constructed with the units. Some of the features of split masonry construction are pointed out in the brief text. Split Rock.
Our Identification No. 113.

Rexarc Hard-Facing and Manganese Electrodes. Form RX-6-30-52. An 8-page booklet describing the company's line of "Rexarc Electrodes" for rebuilding and hardfacing of machine parts subject to extreme wear, impact, corrosion, and abrasion. The bulletin gives details of each electrode in the series and recommended applications. Included are tips for obtaining best results when applying these types of electrodes. The Sight Feed Generator Company.
Our Identification No. 114.

Aeroflex Plastic Tubing. This folder uses drawings to show the use of split plastic tubing in covering wires of prestressed concrete to prevent the steel from bonding with the concrete. Advantages of the plastic over other methods are listed and the ease of applying is stressed. Dimensions are given and diagrams of prestressed girders are shown. Anchor Plastics Company.
Our Identification No. 115.

Plaster-Weld, The Ageless Bonding Agent. This small folder presents the claims of an agent for bonding plaster to other surfaces. Some large building projects that have used the material are shown and others are listed. Directions for using are included. Larson Products Corporation.
Our Identification No. 116.

July, 1953

MORE INFORMATION PLEASE

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RESEARCH DEPARTMENT
431 S. DEARBORN ST.
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Please send more information on items described in editorial columns of this issue, as circled below.

101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130

Please send more information on products shown in the Advertisement on:

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Company____

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City____ Zone____ State____

NEW MACHINERY and SUPPLIES

● New Block Cubers

Two types of pneumatic block cubers have been put into operation in several concrete block plants recently by the *Gene Olsen Corp.* Said to reflect considerable labor savings, one of the units is a crane type, the other a boom model. The former has single or dual cubing clamp assemblies, the latter only a single.

Space, traffic patterns and other considerations govern which model to use. Placing the loaded rack on a turntable adjacent to the cubing station, permits the turning of the rack to unload the opposite side after block has been removed from the near side. The base blocks are positioned to fit the needs of the particular lift truck. Succeeding layers are then placed with the cuber.

Our Identification No. 117.

● Mechanical Lift Table

A lift table for lifting heavy tools, jigs, dies, and other objects that is operated by a vice-type handle turning a screw, is being offered in an improved model.

The new model is lighter in weight and now weighs 380 lbs. It is 26 in. wide, 43 in. long and 28 in. high. When raised

the top is 14 in. maximum above the closed height. Six-inch steel wheels and a floor lock are standard although other styles of wheels are available. The "Liftable" is manufactured by Service Caster and Truck Corporation, Somerville, Mass.

Our Identification No. 118.

● Tractor Excavator Unit

Readily adaptable to many uses in concrete manufacturing, the Pippin Excavator has been re-engineered for heavier duty work, *Pippin Construction Equipment Co.* reports. The new model digs deeper (over 10 feet), swings wider (120 degree arc), deposits load 12½ feet away, reaches higher (12 feet) and has hydraulic controls and stabilizer plates. The digger can be used to lower septic tanks, large pipes, etc., or can be converted to a shovel in five minutes. It fits Ford and Ferguson tractors and is being adapted to other makes.

Our Identification No. 119.

The projected growth of the American labor force, based on population estimates, shows that by 1975 more than 88,000,000 persons will be gainfully employed. Of this number, about 60,000,000 will be men and 30,000,000 women.

With Bradleys like this, washing time is reduced. (Pre-Cast Stone Model)

And women as well as men enjoy the sanitary features. (Stainless Steel Model)

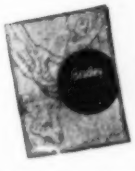
Complete the washing facilities with Bradley Showers as shown at right side above and you have

The Finest in Washroom Fixtures

American industry has found that Bradley Washfountains and Showers provide the maximum capacity while making savings in space, water consumption, piping connections and maintenance. With foot-control Bradley Washfountains eliminate faucets, so hands touch nothing but the clean running water while up to 10 are accommodated simultaneously. The bowls are self-flushing to prevent collection of contaminating water.

Multi-Stall Showers are furnished in 5- and 3-Stall Units — shipped partially assembled for quick installation.

During over 30 years Bradleys have become recognized as the finest and most sanitary washing fixtures available, — an aid to better human relations. BRADLEY WASHFOUNTAIN CO., 2307 W. Michigan Street, Milwaukee 1, Wisconsin.



Complete Catalog 5204 mailed on request.

BRADLEY washfountains and showers

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For better, stronger window installations

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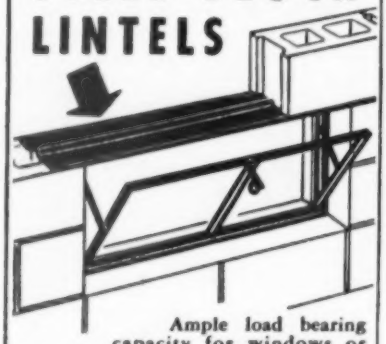
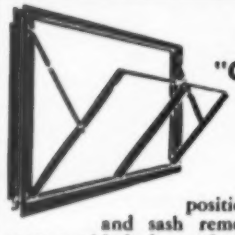
STEEL BLOCK LINTELS



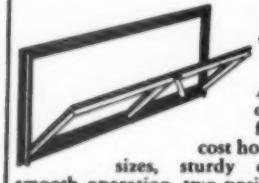
Ample load bearing capacity for windows or doors. Available from 2-ft. 6-in. to 5-ft. Formed from 10 gauge hot rolled steel with stiffening crimp in center. Beveled edge provides masonry bond and seat for mortar. Saves costs through use with standard 8-inch blocks. Vento pressed steel angle lintels for brick construction also available.

VENTO STEEL BASEMENT WINDOWS



VENTO "CHAMPION"

Three sizes. Effortless operation gives three position ventilation and sash removal. Double contact with leak-proof water-shed sill stops wind and rain. 14 gauge electric welded frame. Fins welded to jambs for easy installation in block or poured walls.



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A real economy window for lower cost housing. Three sizes, sturdy construction, smooth operation, two position ventilation and easy sash removal. Fin flanges at jambs for quick installations.

***Also** casement, utility and barn windows. Write for full information.*

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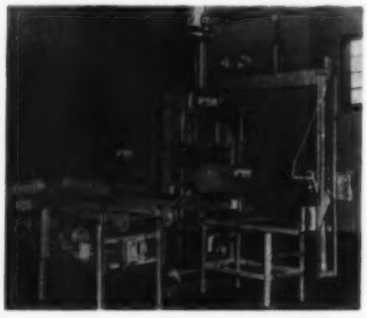
[illegible] COLORADO AVE. BUFFALO 15, N.Y.

● 4-500 Blocks An Hour

A new fully-automatic concrete block machine, rated at 400-500 standard 8x8x16-in. block per hour, has been developed by *Fleming Mfg. Co.* One man controls the removal and racking of block, which has a finger-tip controlled chain-driven off-bearer. Completely hydraulic,



the machine employs solenoid valves for positive action of each operation, and has five motors totalling 11 hp.

One set of plain steel pallets, either 18x18" or 18x22" is used and are received at either side by a roller conveyor. High speed vibration and pressure compact the block. The operator can adapt the machine to the moisture content of the concrete and to the aggregate. Block height is controlled to within 1/64", Fleming says.

Our Identification No. 120.

● Block Lift Truck

Block and pipe manufacturers will be interested in a new line of Liftmaster fork-lift trucks announced by *B. B. Miller Co.* Pneumatic-tired for varied working conditions, the units are made in 4, 5, and 6,000 lb. capacities. An extra heavy chassis of half-inch channel steel is fitted with masts, available in va-

rious lifts, plus a hydraulic system and a counterweight that gives the unit a low center of gravity for added stability. A Ford overhead-valve engine and syncro-mesh transmission, heavy-duty oil-bath air-cleaner and an external 2:1 reduction gear differential are other features. An automotive-type hood permits easy servicing.

Our Identification No. 121.

● Build Scale Models

If you want to add a little dramatic "punch" to your business, build some scale models of structures that can be erected with your products! Anything from tiny sheds to huge apartments can be readily and inexpensively assembled, using a model building material kit developed by *Hoyt Rust* of Denver. A home can be built to scale in a half-hour, including walls, stairs, furniture, simulated sidings, etc., all held together by metal clips.

Our Identification No. 122.

● New Scoot-Crete

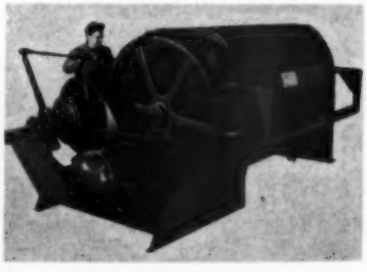
Operating efficiencies feature a new 3,000-lb. capacity N-52 Scoot-Crete announced by *Getman Bros.* The diesel powered unit is highly maneuverable, turning within its own 90-in. length. It is 43-in. wide and weighs about 1,100 lb.

empty. Standard truck transmission produces speeds up to 15 mph. Flat rack or dump box bodies 14, 16 or 20 cu. ft. are available and are quickly interchanged. A high speed automatic transmission is optional equipment.

Our Identification No. 123.

● 50 cu. ft. Mixer

A new batch mixer for concrete plants has been added to the *Praschak Machine Co. line.* Having 50 cut. ft. capacity, it offers extra heavy, adjustable cast spiral blades; interchangeable cast liners in small sections; a hinged safety grate over



the main drum; drum end seals to prevent leakage around shaft; locking discharge control, and many other features. The mixer has a 30-hp ball-bearing motor, solid friction clutch, heavy duty sealed 4" ball bearings on its main shaft and a V-belt drive.

Our Identification No. 124.

New Ideas for Concrete Masonry Construction, a 4-page insert prepared by the National Concrete Masonry Association, recently appeared in *The Producers' Council Technical Bulletin No. 65,* which was distributed to more than 10,000 architects. Low-height, split, and other types of concrete masonry units were given attractive coverage, with emphasis on their versatility and their adaptability to many styles of architecture.

• Abrasive Blades

Abrasive blades that are said to cut masonry materials with speeds approaching those of diamond blades have been brought out by the Clipper Manufacturing Company, 2800 Warwick, Kansas City 8, Mo.

The new blades are said to cut through concrete block in 17 seconds. They are wet cutting and have factory dressed edges, steel blade centers, and protective blade blotters.

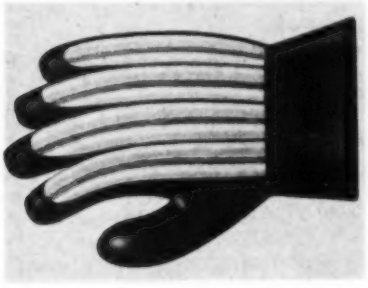
Our Identification No. 125.

• Plastic-Coated Glove

A heavy-duty plastic-coated glove that reputedly outwears ordinary plastic has been introduced as the "Durox" line by the Edmont Manufacturing Company, 1208 Walnut Street, Coshocton, Ohio.

The new gloves are said to have a tempered coating that is long wearing and that has wet-grip qualities that recommend it for handling materials or tools that are coated with grease, oil, or other slippery agents. Several styles of coatings and shapes are included in the line.

Our Identification No. 126.



• Waterproofing Paint

A new oil base paint, containing a volcanic ash grit-like filler, is being sold for waterproofing masonry surfaces by the *Monroe Co.* Called "Damp-Seal", the paint is said to resist moisture on interior and exterior surfaces for long periods due to its ability to fill the pores and halt capillary action. No sizing is needed, and it can be used below grade as well as above to resist lime, alkali, salt, mold and fungus, Monroe says. Seven colors are made, ready mixed for brushing or spraying.

Our Identification No. 127.

• Lift Truck Tire

Down time is virtually eliminated by a new demountable Innacush solid lift truck tire for field changeover purposes, the *United States Rubber Co.* says. The tire can be changed in ten minutes or less, with no need for extra wheels, no pressing charges or special training for maintenance men, and three sizes replace 10 sizes of existing pressed-on solid and pneumatic tires, U. S. claims. The demountable Innacush is specially designed for a split wheel tapered to 12½ deg. and slightly larger than the tire.

Our Identification No. 128.

• Wire Roller

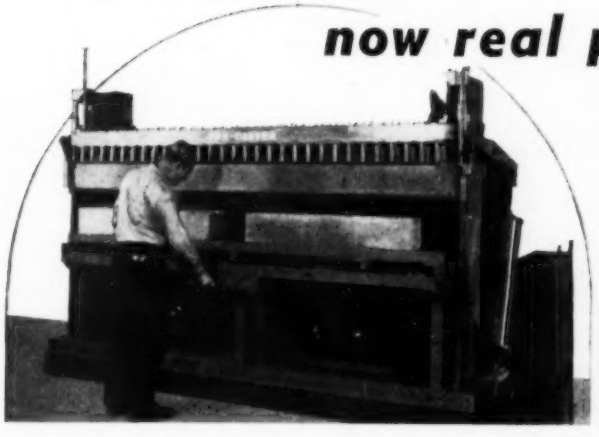
Designed for concrete pipe manufacturing but adaptable elsewhere, a new lightweight roll that forms reinforcing wire to any desired radius has been developed by *Houston Concrete Mchy. Co.* Handling wire of any gauge in widths up to 60-in., the unit has three gear-driven rolls to form cages of any radius.

Our Identification No. 129.

• Moisture Tester

Rapid, economical moisture testing of fine aggregate and other granular materials is possible with a portable English-made unit, reports *Engineering Products Co.* In a non-technical, 3-minute test the unit determines moisture content through the use of a chemical reagent that is mixed with a weighted sample of the aggregate. Various calibration patterns are available, dependent on the substance to be tested.

Our Identification No. 130.



now real profits from hard to make units

Such as LINTELS, HIGHWAY GUARD RAILS, PARKING LOT MARKERS AND SLABS

• Enterprising concrete product manufacturers will welcome the opportunity to turn these "hand-operation" products to a profitable plus volume on a production basis. The new PreCaster with low initial investment, low maintenance and operating cost *can make any shape that will strip through a straight box.*

• Now you can book volume orders for any of these precast concrete units . . . hard to make by hand methods. Cut the costs by PreCaster's fast production and build handsome profits. Dense units from electrical vibration under pressure. Texture to match blocks in same building. Better service to your customers pays dividends.

- PreCaster extra heavy . . . heavy steel stripper head frame consisting of two heavy 2″ x 3″ cold rolled bars
- Makes units with 4″ variations . . . 4″, 8″, 12″, 16″ up to 10′ long . . . any lintel 4″ x 8″ or 8″ x 8″ up to 10′ long . . . for example
- Mould box made to fit any width pallet . . . quick change
- Superior electrical vibration from two V-200 Syntron units
- Handles any aggregate
- One man operation
- Industry-proved . . . pilot machine used 2½ years and going strong!

Write for data sheet and price list

PreCaster Inc.

5217 Beech Street · Cincinnati 17, Ohio

YELLEN
HI-SPEED
BLOCK MACHINE
PERTH AMBOY, N.J.

THIS TRADEMARK is your assurance of low-investment, high-capacity production of uniform, true-sided blocks, with minimum rejects and spoilage.

A YELLEN Machine means:

- Economical operating and maintenance costs. All parts interchangeable . . . few wearing parts.
- Efficient, auto-controlled output of 3,500 blocks per day with minimum crew.
- Makes either plain or Mortarless Interlocking Blocks.

Write for full particulars including our exclusive territorial franchise in Mortarless.

Mortarless Machine Corp.
2623 Riverside Dr.
Los Angeles 39, Cal.
Exclusive Pacific Coast Agents

Botched Batches

A Fair Yield at That

A NEWSPAPER clipping we received some time ago points out that one cubic foot of cement, plus two cubic feet of sand, plus three cubic feet of coarse aggregate will *not* equal six cubic feet of concrete. "The sand and cement," it goes on to say, "will fill voids in the coarse material so that only about eight cubic feet of concrete will result."

It's a mighty disappointing transaction, but if that's the best that can be done, we'll take it.

Safe on All Thirteen!

WE HAD somehow hoped that the chlorophyll-addition epidemic might run its course without infecting any of our industries, but apparently it wasn't to be. At any rate a more-than-usually cryptic press clipping which landed on our desk the other day states that a cement has been developed which inhibits undesirable odors. If your customers insist that the concrete you've been sending them stinks, we suggest you look into this. It may just be that the cement you're using isn't dainty.

Cookery

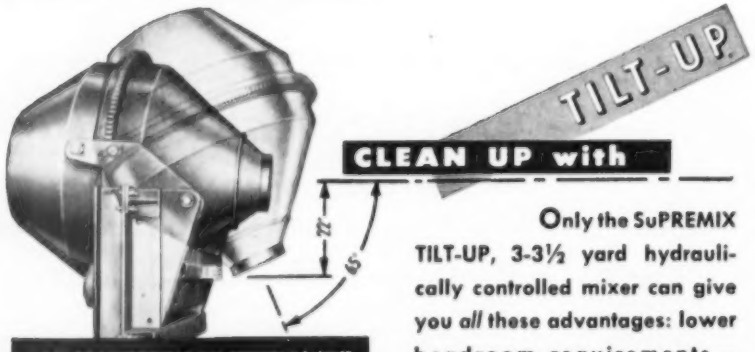
A STAFF writer of the Dallas *Times-Herald*, in a recent feature article concerning the manufacture of portland cement, teed off with this sparkling bit of prose: "Turning out high-grade cement is something like baking a cake, only with dragline, boiler, and gristmill in your kitchen."

Yessir, we'll never forget those wonderful cakes Mom used to turn out with that little old 300-ft. coal-fired rotary kiln in our kitchen back home!

Relativity

IN awarding $500 to a plaintiff at Woodland, Calif., the other day a Superior Court judge ruled that a "simple trivial offense by a trespassing dog, such as walking on fresh concrete, does not justify killing it".

Look, Judge, we don't want to start a row, but if that's a trivial offense, would you mind just giving us a hint as to what would constitute a *serious* one?



FOR CONVERTING TO CENTRAL MIX
As it requires less headroom, the TILT-UP SuPREMIXER is the only mixer feasible in most plants. It's easy to install, no raising of the plant or lowering of drive.

FOR A PACKAGE PLANT
Reduced headroom requirement means reduced height, construction and power costs. Efficiently permits dry batch in one lane, central mix in the other.

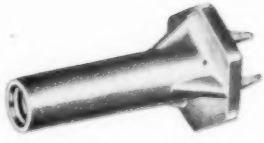
FOR A SEMI-PORTABLE PLANT
Crane feeding is easy with SuPREMIX. Separate A-frame mounting with bin structures bolted for quick, easy set up provide real flexibility for your rush defense jobs.

Only the SuPREMIX TILT-UP, 3-3½ yard hydraulically controlled mixer can give you *all* these advantages: lower headroom requirements—steeper discharge of 65°—no segregation—reduced thrust—and virtually fixed discharge. The hydraulic system is part of the unit—no costly compressor to buy. The unique features of this mixer make it the ideal mixer . . .

Aggregate Bins Cement Bins Cement Storage Elevators
Conveyors Ready Mix Plants Expressway Semi-Portable Plants
Dry Batch Plants

Manufactured by
L. BURMEISTER CO., 4531 W. Mitchell, MILWAUKEE 14, WIS.

P-D KASEMENT-KLAMP



The Answer to Anchoring Window Sash and Reinforcing in Precast Concrete Door and Window Casements.

•

PRECISION DEVICES, INC.
147 Cedar Street
New York 6, N. Y.

What a difference it makes when you use PERMALITE

IN CONCRETE, FOR INSTANCE:

Permalite perlite aggregate concrete is the ideal lightweight insulating fireproof concrete for roof decks, roof fill and floor fill. While ordinary sand-gravel concrete weighs 120 to 150 lbs. per cu. ft., Permalite concrete can be made from 20 to 50 lbs. per cu. ft., making possible immense savings in dead-weight and permitting great economies in the use of structural steel and other building materials.

Permalite concrete offers 10 times greater insulating value than ordinary concrete; 15 times greater fire-resistance; 10 times greater elasticity; plus better workability, ease of handling, flexibility in mixes, and high strength-to-weight ratio.

AND IN PLASTER—

Permalite perlite aggregate plaster offers the lightest, thinnest, most economical means available for achieving 2-, 3- and 4-hour fire-protection for steel columns, beams and girders. Permalite plaster is only ⅓ the weight of ordinary sanded plaster, thus affording tremendous reductions in dead-weight with corresponding savings in structural steel. The use of Permalite plaster to fireproof an 18-inch beam with a 25-foot span, for instance, reduces the dead-weight by 200 lbs. per lineal ft.

To get the full story on Permalite's many advantages, send today for your free bulletin on Permalite, the largest-selling perlite aggregate in the world. Write Great Lakes Carbon Corporation, Dept. J-467—612 So. Flower St., Los Angeles 17.

Dependable GREAT LAKES **Permalite**®

THE LARGEST-SELLING PERLITE AGGREGATE IN THE WORLD

PROCESSED FROM PERMALITE AND ALEXITE ORES ONLY BY THESE EXCLUSIVE PERMALITE FRANCHISEES OF GREAT LAKES CARBON CORPORATION

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Perlite Products Corp., Dallas, Texas
Rushmore Perlite Products, Rapid City, South Dakota
William J. McCormack Sand Co., Inc., New York, New York
Pennsylvania Perlite Corp., Allentown, Pennsylvania
Airlite Processing Corp. of Fla., Vero Beach, Fla.
New Jersey Perlite Corp., Newark, New Jersey
MacArthur Company, St. Paul 4, Minn.
McClure & Erickson Corp., Los Angeles, California
Perma Rock Products, Inc., Baltimore 30, Maryland
West Indies Perlite Mfg. Co., Inc., Havana, Cuba
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NEW!

APPLEY PRECAST CONCRETE LINTEL FORMS

A new product with new profits for you—Appley Hex-Type Precast Reinforced Concrete Lintel Forms. They are practical! They are economical! Appley lintel forms eliminate costly forming and pouring of lintels over window and door openings. Appley forms reduce building costs at no sacrifice to quality. And because lightweight materials are used, field erection is made without use of heavy equipment.

Available in lengths of 3'-0" to 14'-0".

CHECK THESE FEATURES OF APPLEY SUPERIORITY

1. No tools are needed to set up forms—only four wing nuts to remove.
2. All welded construction; nothing to wear out!
3. Easy stripping at all times, even with unskilled labor!
4. Modular size.
5. Removable core for easy cleaning and stripping.

Write for free descriptive literature.
J. W. APPLEY & SON, INC.
St. Petersburg, Florida
Manufacturers of Block Machines, Mixers, Skip Hoists and special forms.

J.W. Appley & Son, Inc.
831 9th St. No.
St. Petersburg, Fla.

Gentlemen:
Kindly send me complete information and price lists on your new Precast Concrete Lintel Forms.

NAME _____
ADDRESS _____
CITY _____ STATE _____

J.W. APPLEY & SON, Inc., St. Petersburg, Fla.

HERE ARE HELTZEL'S NEW *COMPLETELY AUTOMATIC ELECTRONICALLY CONTROLLED* BATCHING PLANTS...

Two new Heltzel Batching Plants at work on the Ohio Turnpike. Built to conform with Ohio Turnpike Commission specifications, the Cement Plant (left) has a 400 bbl. capacity with a 375 bbl. recirculator. Three-compartment aggregate Plant (right) holds up to 200 tons.

Here's real news for contractors who want batching equipment that will do more with less labor. The new electronically actuated fully automatic Heltzel plants designed for road builders, truck mixer and central mix operations.

Push button operated by one man these job-tested plants will batch up to 250 yards of perfectly proportioned batches per hour . . . with 29 separate batch combinations immediately available to the operator. Each batch, time and amount electrically recorded for easy daily tabulation.

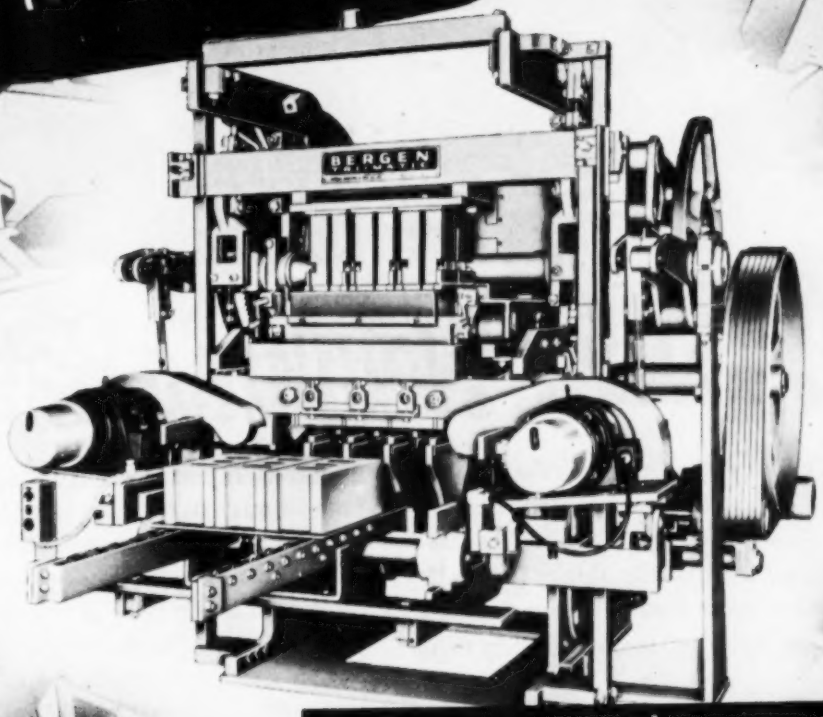
Portable, the plants were designed for quick set-up and knock-down, easy over-the-road handling. For permanent installation Heltzel's combination cement-aggregate plant would be used instead of two separate plants.

For additional information write or call **The Heltzel Steel Form and Iron Co., Warren, Ohio,** and ask for Bulletin O-21.

Push button panel with recording equipment. Each of the 29 batch selection buttons controls a completely different mix. Panel will be wired to suit your individual requirements. Recording equipment optional.

— Naturally It's A Heltzel *Product —*

1,000 BLOCK PER HOUR
(8" EQUIVALENT)



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BERGEN
TRI-MATIC

Phone us "COLLECT" . . . NUtley 2-7300

BERGEN MACHINE & TOOL CO., INC.

189 FRANKLIN AVE., NUTLEY, N. J.

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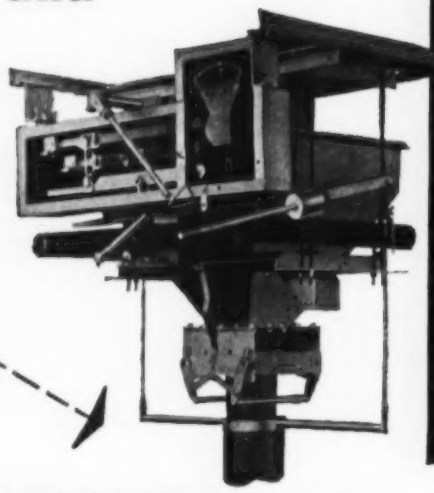
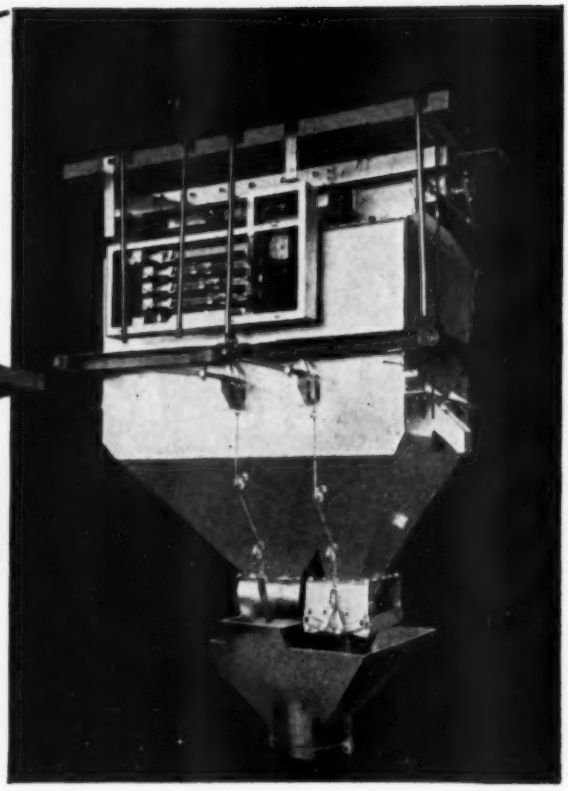
heart and

hand

is the





BUTLER Weighing Batcher

Head? Yes, because whether it's for a Roadbuilders' Plant or an immense Central Mixing operation, a BUTLER Batcher is a fast-acting robot that virtually thinks for itself. The fully automatic, pushbutton units do *all* the thinking, faster and more accurately than a man.

Heart? Yes, because it's the BUTLER Batcher that keeps materials in smooth-flowing circulation with a pulse-like, never-failing regularity — batch after batch, month-in and month-out.

Hand? Yes, because a BUTLER Batcher "hands-out" batches to your trucks with split-pound accuracy and at a speed that keeps them humping to keep up.

So, whether you need a completely automatic, vastly complex, mistake-proof, push-button Batcher to weigh out as many as 8 materials . . . or a combination Batcher for cement and aggregate . . . or a Batcher for 3 aggregates . . . or fast-stepping, high production Batchers for your Roadbuilders' set-up — it's profitable and wise to insist on the BUTLER nameplate.

BUTLER Weighing Batchers are readily installed on any plant — regardless of make. So if your batching equipment is getting on the old and jaded side, give your plant a new and active head, heart and hand — a BUTLER Weighing Batcher — and watch your production soar.

BUTLER BIN COMPANY

987 BLACKSTONE AVENUE
WAUKESHA, WISCONSIN

FAST AND CLEAN DISCHARGE of even the lowest slump concretes is made possible by the patented blade design of this Worthington Hi-Up Truck Mixer, one of a fleet owned by the McNamee Ready Mixed Concrete Co. of Xenia, Ohio.

"Drivers, shop men, customers—everybody likes our new Worthington HI-UP Truck Mixers"

Says Charles F. McNamee of the McNamee Ready Mixed Concrete Co., Xenia, Ohio

McNAMEE DRIVERS LIKE THE HI-UP because its unrestricted hopper opening keeps charging time to a minimum. Both charging and mixing are accomplished with the drum rotating in the same direction. And the engineered weight distribution of the Hi-Ups lets you carry the maximum legal payload.

Mr. McNamee goes on to say:

"We particularly like our new Blue Brutes' heavy-duty transmission and their ease of operation. Our shop men like the provisions for easy maintenance; for example, they point out the relatively few lubrication points and their ready accessibility. The drivers say the machines are unusually easy to handle and to keep clean, that they mix and discharge exceptionally well. But what makes us happiest of all is that the machines and their product are liked by our customers."

We've been getting letters like this from Worthington Hi-Up Truck Mixer users all over the country. Why not find out for yourself about these modern Blue Brutes. Get the facts from your nearest Worthington distributor, or write directly to Worthington Corporation, Construction Equipment Division, Section R.3.6, Plainfield, N. J.

R.3.6

WORTHINGTON

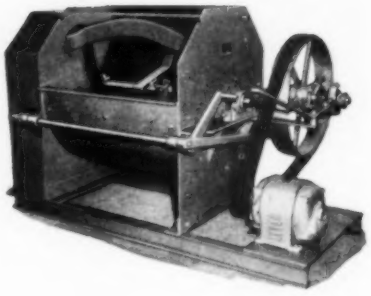
IF IT'S A CONSTRUCTION JOB, IT'S A **BLUE BRUTE** *JOB!*

V-BELTS • QD SHEAVES • AIR COMPRESSORS • CENTRAL MIXERS • VERTICAL TURBINE PUMPS • CIRCULATING PUMPS

KENT

CONCRETE PRODUCTS MACHINERY

KENT Batch Mixers

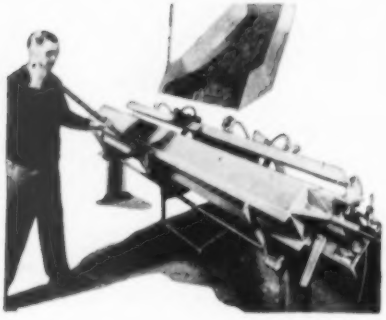


Sturdy machines designed for large output with minimum operating and maintenance expense.

All steel construction with replaceable, hardened liners. Heavy duty cast mixing blades. Anti-friction bearings. Positive Conway clutch. V-Type Positive belt drive. Explosion proof motors. Cut Gearing. Self-cleaning discharge gate. Safety grid.

Capacities: 12, 18, 24, 30, 42 and 50 cu. ft.

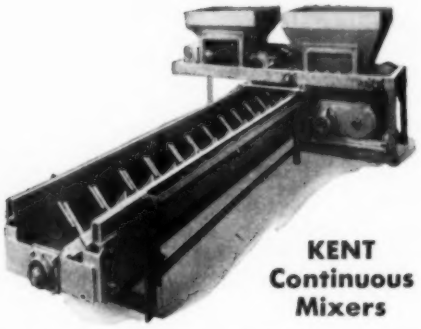
Write for details and prices.



KENT Lintelators

produce better lintels and sills faster and more economically than by any other method, opening a new market for profitable sales. Units available for making various sizes.

Builders really "go" for these lintels which simplify installation and harmonize with all concrete structures.

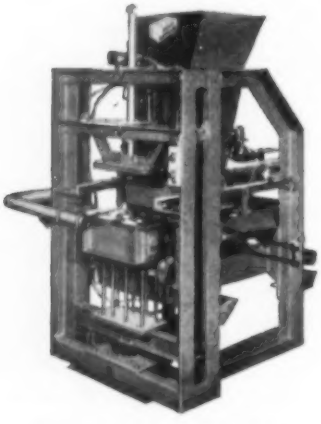


KENT Continuous Mixers

step up output, eliminate production problems, save labor and increase profits.

Fully automatic, the operator Sets it—Starts it and Leaves it to attend to other duties. Up to four aggregates can be fed with the proportion of each accurately controlled. Each is a versatile machine since the number of paddles, their angle and position on the shaft are all variable—also the cycle of mixing and length of time the aggregate is retained is variable up to 12 minutes.

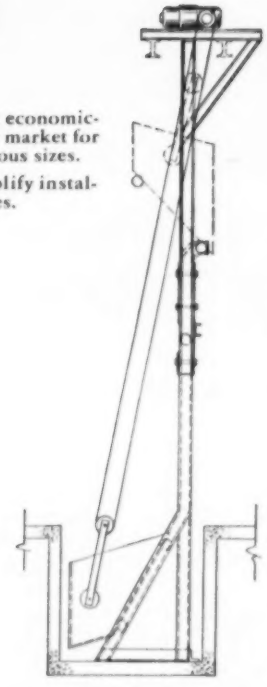
Sizes available for various machines including the largest machines.



KENT Block Machines

Compact, highly advanced machines. Low first cost and operation cost enable small and medium producers to compete with large manufacturers.

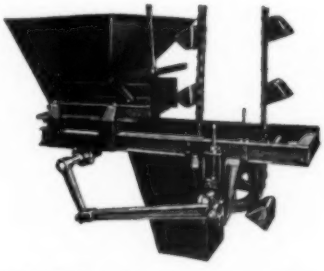
Illustrated is the Kent Standard Blockmaker—semi-automatic machine. Others are the Kent Duplex Blockmaker which makes two blocks at a time and a highly advanced and refined plain pallet machine known as the KENTWIN.



KENT Skip Hoist

These hoists, in vertical or inclined type, are available in capacities of 12, 18, 30, 42 and 50 cu. ft.

The heavy duty geared head motor contains mechanism for adjusting the stop positions. Push a button—the skip rises and stops at the dumping position. Push another button and it lowers and stops at the loading position.



KENT Feeders, Elevators, Unloaders, etc.

Machines are available for unloading sand, crushed stone, gravel, aggregate, etc., from under gondola cars, from pits or bins and feeding this material to elevators.

Other elevators are available for delivering concrete from the mixer to bins on block machines, etc.

Literature Available Specifically Describing All Products

The **KENT MACHINE CO.** Cuyahoga Falls, Ohio

Manufacturers of **CONCRETE PRODUCTS MACHINERY** *Since 1925*

Once is not enough!

The need for blood is greater than ever, not only for men wounded in combat, but here at home . . . to cure disease, to meet accidents and disasters, and to prepare for civil defense.

Our quota can ONLY be met, if those who give *keep on* giving . . . regularly!

You CAN give more than once . . . as often as every three months with complete personal safety. The more often you give the more often you save a life. For every pint of blood you give goes to someone who needs it desperately.

Remember . . . once is NOT enough. Give blood again and again! Call your Red Cross, Armed Forces or Community Blood Donor Center for an appointment to give blood today.

GIVE BLOOD

...give it again and again

BUSINESS EXECUTIVES!

CHECK THESE QUESTIONS

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ◯ HAVE YOU GIVEN YOUR EMPLOYEES TIME OFF TO MAKE BLOOD DONATIONS?
- ◯ HAS YOUR COMPANY GIVEN ANY RECOGNITION TO DONORS?
- ◯ DO YOU HAVE A BLOOD DONOR HONOR ROLL IN YOUR COMPANY?
- ◯ HAVE YOU ARRANGED TO HAVE A BLOOD-MOBILE MAKE REGULAR VISITS?
- ◯ HAS YOUR MANAGEMENT ENDORSED THE LOCAL BLOOD DONOR PROGRAM?
- ◯ HAVE YOU INFORMED EMPLOYEES OF YOUR COMPANY'S PLAN OF CO-OPERATION?
- ◯ WAS THIS INFORMATION GIVEN THROUGH PLAN BULLETIN OR HOUSE MAGAZINE?
- ◯ HAVE YOU CONDUCTED A DONOR PLEDGE CAMPAIGN IN YOUR COMPANY?
- ◯ HAVE YOU SET UP A LIST OF VOLUNTEERS SO THAT EFFICIENT PLANS CAN BE MADE FOR SCHEDULING DONORS?

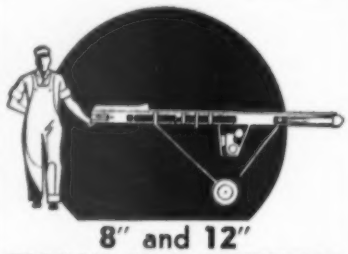
Remember, as long as a **single** pint of blood may mean the difference between life and death for **any** American . . . the need for blood is **urgent!**

NATIONAL BLOOD PROGRAM

Concrete Manufacturer Classified Section

431 S. DEARBORN ST., CHICAGO 5, ILL.

Advertising Rate Per Issue: $10.00 a Column Inch. Lower Rates on a Contract Basis — Write for Rate Card.



8" and 12"
TROUGH BELT CONVEYORS

Sand • Gravel • Redi-Mix

Basement Excavating
18' - 24' - 30'

$444 to $770

Gas or Electric Drive

Send for Literature

New London Engineering Co
NEW LONDON • WISCONSIN

FOR SALE

LORAIN THEW SHOVEL BOOM

Chain Guide and Large Hoist Sheaves. Chain Crowd. 18 Foot Shovel Boom. ¾ Yard Type Dipper. Serial Number D-22597-4. M.D.-27873.

Complete With All The Attachments.

VOLZ CONCRETE MAT. CO.
8801 Page Avenue
Box 228, Clayton Station
St. Louis 5, Missouri Phone Winfield 1544

FOR SALE

Large block plant in small southeastern town. Leased Besser equipment. Sales last year over two million block. Priced for quick sale $125,000.00 cash plus inventory.

BOX NO. GQ-86
c/o The Concrete Manufacturer
431 South Dearborn St. Chicago 5, Illinois

WANTED: Septic tanks that need cleaning!

BIONETIC is a safe, sure, economical method.

Cleans sewage solids from tank
Eliminates odors
Cleans tile fields, prevents plugging
Cleans grease traps
Harmless to humans, and plumbing

BIONETIC at $4.25 per pound, or case of 12 one pound containers $48.00, 25 pound drum $3.25 pound.

Advisory Service, write us.

RELIANCE CHEMICALS CORPORATION
P.O. Box 6724, Dept. PQ Houston 5, Texas

WANTED

A large established New Jersey Concrete Concern has an opportunity for a concrete Engineer or Technician who is thoroughly experienced with ready mixed concrete.

Box No. DM-58 c/o CONCRETE MANUFACTURER
431 S. Dearborn St. Chicago 5, Ill.

---

6 HI PRESSURE AUTOCLAVES

IMMEDIATE DELIVERY WITH QUICK ACTING DOORS. EACH KILN CAPABLE OF CURING 4000 8" EQUIVALENTS. PRICED FOR QUICK SALE. IF YOU ARE INTERESTED IN HIGH PRESSURE CURING IT WILL PAY YOU TO INVESTIGATE AT ONCE.

DINABURG BLOCK CO.
Binghamton, N. Y.

CEMENT COLORS

Write for free samples and prices of "LANSCO" CEMENT COLORS produced in 34 attractive shades. Packed in bulk and in 1 lb. and 5 lb. packages.

manufactured by
LANDERS-SEGAL COLOR CO.
71 Delevan St. Brooklyn 31, N. Y.

FOR SALE

Half interest in modern concrete block plant. Annual sales $300,000.00. Located in midwest. Steady growth. Return 25-30 per cent on invested capital. Write to

BOX NO. GQ-81
c/o CONCRETE MANUFACTURER
431 S. Dearborn St. Chicago 5, Ill.

Two ready-mix concrete plants priced for immediate sale. Located in Pulaski and Lawrenceburg, Tennessee, eighteen miles apart. Lawrenceburg also has complete block plant. No competition. Equipment in excellent condition.

JOHN R. STEPHENS
Pulaski, Tennessee

SCREEN FOR SALE

Type M 42" x 96" Universal vibrating screen complete with motor and drive, cloth. Good condition. Located near Joliet.

BOX NO. GQ-89, c/o Pit and Quarry Publications
431 S. Dearborn St. Chicago 5, Ill.

STOP that WATER

With FORMULA NO. 640

A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—holds 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs: Applies quickly—no mixing—no cleanup—no furring—no membranes. Write for technical data—free sample.

HAYNES PRODUCTS CO., OMAHA 3, NEBR.

A LIFETIME OPPORTUNITY

Make $1000 monthly as easy as rolling off a log; facing building blocks in Real Stone Color & Design in your back yard. Also applying stone siding, cost only $6.00 per square, deposit for equipment only $300.00. American Natura-Stone Company, 2407 Garrison Blvd., Baltimore 16, Maryland.

MINERAL COLORS
for
BRICK MORTAR
STUCCO-PLASTER-CONCRETE

"Fine Because of Their Fineness"
Ask for samples and recommendations.
BLUE RIDGE TALC CO., INC.
HENRY, VIRGINIA

For Immediate Sale

2—3 yd. Jaeger Truck Mixers 1947 Unmounted — Price each $1,250.00
1—4½ yd. Jaeger Truck Mixer 1947 Unmounted — Price $1,500.00
2—1½ yd. Concrete Transport Mixers Mounted on 1951 Int. L-162—Price $2,000.00 each
1—1947 Mack Truck — EHU-1655 Single Axle. Price $1,000.00.

Above units in good operating condition.

POSTON BRICK & CONCRETE PRODUCTS CO.
Springfield, Illinois Tel. 8-3403

FOR SALE

Vibrapac. About 7 yrs. old and in very good condition. Has been steam cleaned and painted. Available immediately.

DeClerk Industries, Inc., 6497 East 10-Mile Rd., Centerline, Michigan.

1—Godfrey Portable Track Conveyor
1—Bonded 14" Corrugated 2-Roll Crusher
1—18" Belt, 40' Port. Conveyor, completely motorized
1—Dings 2-Roll Magnetic Separator
1—Bonded Vibrating Screen
1—18" Belt, 55' Portable Conveyor
All motors, controls, switches included.

A complete sinter crushing and screening plant for sale at a very low price. This equipment is practically new.

BOX NO. GQ-85, c/o Concrete Manufacturer
431 S. Dearborn St. Chicago 5, Ill.

FOR SALE

Stearns Model C Clipper Stripper, 12' Mixer, 18' Skip Hoist, 1000 Cast Iron Pallets. Any reasonable offer considered.

BOX NO. GQ-88,
The Concrete Manufacturer
431 S. Dearborn St. Chicago 5, Ill.

FOR SALE

Complete Concrete Pipe Plant Equipment
(1) Concrete pipe machine—12"-72" diameter 4 ft.-8 ft. lengths.
(2) Besser Mixer
(3) Besser Skip Loader
(4) Wire Roller
(5) Roller, etc.

Guaranteed A-1 Condition.

Box No. GQ-80, c/o Concrete Manufacturer
431 S. Dearborn St. Chicago 5, Ill.

FOR SALE

1 Appley Little Giant
1 Lift Truck
1 Go-Corp Junior Block Machine
1 Four-at-time Block Machine
Racks, Pallets, etc.

BOX NO. HR-202, c/o The Concrete Manufacturer
431 S. Dearborn St., Chicago 5, Illinois

FOR SALE

2-yd. Rex on 1941 IHC, no tires, fair condition, Jaeger on 1941 IHC, $1250; both good condition. 3-yd. Jaeger mixer on 1941 GMC, $1950; 2-yd. $495; all bi-dumps.

FOSTER CONCRETE COMPANY
Bowling Green, Ohio

YOURS TO SERVE

If you have not found the equipment you are looking for, the research dept. of The Concrete Manufacturer can and will gladly assist you. Tell us what it is . . . Write to

Research Dept.
C/O The Concrete Manufacturer
431 S. Dearborn St. Chicago 5, Illinois

UNBREAKABLE
PALLET RINGS
Write for full information
TEXAS FOUNDRIES
LUFKIN, TEXAS

SWAP • SELL • TRADE

3	No. 9 STEARNS Joltcretes	$1400.00 ea.
2	No. 7 STEARNS Joltcretes	$750.00 ea.
1	30 cu. ft. KELLY Concrete Mixer	$1400.00
1	28 cu. ft. STEARNS Mixer	$950.00
1	28 cu. ft. STEARNS Skip Loader	$950.00
2	18 cu. ft. STEARNS Concrete Mixer	$650.00 ea.
1	18 cu. ft. STEARNS Skip Loader	$400.00
2	12 cu. ft. STEARNS Concrete Mixers	$300.00 ea.
40	Racks for STEARNS No. 9, for use with spade type Off Bearer	$ 22.00 ea.
100	Hinge type racks	$ 15.00 ea.

1000's of PALLETS IN STOCK
Send tracing or sample for quotation

WRITE
WIRE
PHONE

GENERAL ENGINES CO.
307 Hunter St., Gloucester, N.J., Phone: Gloucester 6-1337

MAQUINARIA y MOLDES
para fabricación de bloques y tubos de concreto

PIDA CATALOGO
Y PRESUPUESTOS

GEORGE W. HOFFMANN CO.
P. O. Box 452, Sioux City, Iowa, U.S.A.

VIBRAPAC FOR SALE
Vibrapac in good running condition. Includes Oswalt speedup with 10 H.P. vibrator motors. May be seen at any time.
MARSHALL CONCRETE PRODUCTS
2614 Marshall St., N.E.
Minneapolis, Minnesota

1. One Butler No. 7 track plant No. E 1370. This track plant is for unloading bulk cement at railroad siding and loading into bulk trucks.
   - Track screw 10" x 17' - 3⅝"
   - Cement elevator capacity 230-260 bbls. per hour
   - Overall height 25' - 5"
   - Height discharge sprocket 12' - 0"
   - Powered by LeRoy H.P. gas engine Model XP 30
   - Purchased new October 1, 1952 for $3736.00
   - This plant purchased new—never erected and NEVER USED.

2. One—400 bbl. one-compartment auxiliary, ground storage bin—Blaw Knox. This bin purchased new July 1952 at cost of $2945.00.

3. One Barber-Greene portable belt conveyor:
   - 50 feet long
   - 24" belt
   - Wisconsin gasoline motor
   - 16 feet of extra new belt
   - In perfect working condition.

HOWAT CONCRETE CO., INC.
South Capitol at S Street
Washington 4, D.C.

BUILD GOOD WILL
Advertising necessities for the block industry. Line Pins, Twigs, Modular Coursing Stick. Also the new Block Calculator and Wood Corner Block. All imprinted with your advertising. Complete catalog on request.
GERSON CO.
97 Deering Road — Mattapan, Mass.

FOR SALE
1—Hydro Korpack machine
1500—8" Pallets
1500—4" Pallets
1—Hand Jack
Will sell cheap.
CARBONDALE CEMENT BLOCK CO.
P.O. Box 578 — Phone 270L — Carbondale, Ill.

READY-MIX PLANT
Located in a fine Southwestern Community. Fine opportunity. Small investment required. Write:
BOX No. HR-203
c/o THE CONCRETE MANUFACTURER
431 S. Dearborn St. — Chicago 5, Illinois

CEMENT COLORS
All shades and grades the highest quality.
Write for color cards, prices and samples
RICKETSON MINERAL COLOR WORKS
MILWAUKEE 2, WISCONSIN
Established 1885

MODERN BLOCK PLANT FOR SALE
Modern Concrete Block Plant for sale operating as going business. Metropolitan Chicago Area. Lith-I-Bar Automatic 2 Block Machine. 30 C.F. Mixer. Conveyor, Truckman, Pallets, Racks, 2 T Truck, etc. — Priced to sell.
BOX NO. HR-205
c/o THE CONCRETE MANUFACTURER
431 South Dearborn St. — Chicago 5, Illinois

FOR SALE
Brikcrete plant. Complete and up-to-date equipment in excellent condition. Includes colorcrete outfit. Owner is professional man unable to devote time to the business.
DIXIE BRIKCRETE MFG. CO.
Box 317 — Rt. 4 — Camp Croft,
Spartanburg, S. C.

FOR SALE
Lith-I-Bar 2 block, 1 Kelley 30 cu. ft. mixed, 50 sixty block racks, 2000 18 x 18 pallets, 1 aggregate elevator, 1 bagged cement elevator, spare parts for all equipment, attachments for 3", 4", 6", 10", 12" chimney bks, and headers. Changing to larger equipment in fall. This machinery is in excellent condition and will be sold that way.
BOX NO. HR-207
c/o THE CONCRETE MANUFACTURER
431 S. Dearborn St., Chicago 5, Illinois

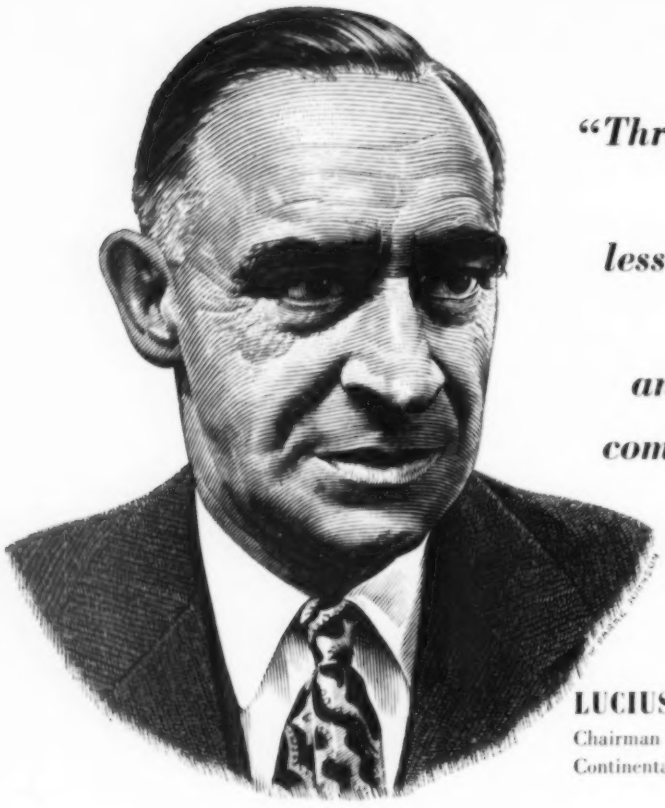
FOR SALE
Gocorp Senior block machine complete with 50 cu. ft. mixer, off-bearer, and 4", 6", 8" and 12" molds for 18" block. This machine is presently operating, is equipped with height and density controls and is priced for quick sale.
BOX NO. HR-208
c/o THE CONCRETE MANUFACTURER
431 S. Dearborn St., Chicago 5, Illinois

FOR SALE
3—Concrete Mixer Trucks Complete.
MIXERS: — Ransome. 3 Yd., 4¼ adjitator.
Hercules gasoline motors. Hi-Dump. New Paint. A-1 Condition.
TRUCKS: — International 6 x 6 Army type.
Gasoline motors. Good tires. New Paint. A-1 Condition.
VOLZ CONCRETE MAT. CO.
8801 Page Avenue
Box 228, Clayton Station
St. Louis 5, Missouri — Phone Winfield 1544

FOR SALE
Stover Hammermill, A-1 condition. Ideal cinder crusher, large capacity. Price 175.00.
NEIL CASHMAN
611 N. West Street — Hillsboro, Ohio

2—Jolcrete 57 Block Machines with 4" and 8" attachments, with approximately 2000 50% void modular 8" steel pallets. 2000 50% void 8" modular cast iron pallets. 2300 50% void 4" modular steel pallets. 2600 50% void 4" modular cast iron pallets. These machines will be sold for highest offer. Will trade. Both machines and pallets can be seen at the:
CEDARTOWN BLOCK AND CONCRETE CO.
Cedartown, Georgia — Telephone 509

LOWER COST
PACKER-HEAD WINGS
Proved to last as long or longer—yet cost considerably less. Write for prices.
TEXAS FOUNDRIES
LUFKIN, TEXAS



"Thrifty citizens . . . with Savings Bonds . . . less likely to be taken in by the false promises and ideologies of communist propagandists . . ."

LUCIUS D. CLAY
Chairman of the Board
Continental Can Company

"The regular purchase of Savings Bonds through the Payroll Savings Plan by millions of our citizens contributes importantly to the country's economic stability, the national defense effort, and to the financial independence of the individual. The thrifty, self-reliant citizen is one far less likely to be taken in by the false promises and ideologies which communist propagandists invariably direct to the 'have nots'."

• To thousands of company executives, accountants, payroll department employees, PSP means Payroll Savings Plan, the simple payroll allotment operation through which employees make a monthly investment in U. S. Savings Bonds.

• To almost eight million employees of nearly 50,000 companies, PSP has a more intimate connotation. To them, PSP spells *Personal Security Plan.*

• Multiply the personal security of a single Payroll Saver by 43,000,000—the number of individuals who hold Savings Bonds having a cash value of $49.5 billion—and you have economic stability that is the keystone of our national defense.

• Thanks to the thousands of companies which offer their employees the Payroll Savings Plan, Bill Brown in the Machine Shop . . . Joe Green in the boiler room . . . and eight million more Browns and Greens can well turn a deaf ear to ". . . the false promises and ideologies . . ." of communist propagandists. Bill can see his new home taking shape in his growing stack of Savings Bonds . . . Joe sees each bond another step toward a college education for little Joe . . . and the "Old Timer," who eats his lunch with Bill, talks of "sitting down pretty soon" because his Bonds will make a nice addition to his Social Security.

• PSP holds still another benefit—this one for the employer. Payroll Savers are conscientious workers. Statistics show that absenteeism goes down, production improves and accidents decrease as payroll participation goes up.

• If employee participation in *your* Payroll Savings Plan is less than 50%—or if your company does not have a Payroll Savings Plan—get in touch with Savings Bond Division, U. S. Treasury Department, Washington Building, Washington, D. C. Learn how easy it is to help your country, your employees and your *company*—through the PSP.

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Pit and Quarry Publications, Inc.

Now! $3097

for 4000-lb. capacity unit with 108-in. lift

- FORD Overhead Valve Engine
- FORD Heavy-Duty Synchromesh Transmission
- FORD Electrical System
- Hydreco Valve and Pump
- Small Turning Radius
- Single or Dual Drive Wheels
- Lift Height to Suit Your Needs
- Low Initial Cost—Low Maintenance Cost

B. B. Miller Co.

1726 E. Washington Blvd.
Los Angeles 21, Calif.
Phone: Richmond 7-4251

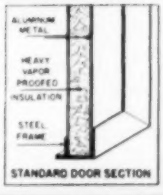
SAVE FUEL • REDUCE CURING TIME • CUT COSTS • UP PROFITS with *Standard* KILN DOORS!

WHERE AISLE SPACE IS LIMITED
The sliding carrier-type door needs no aisle space. Carrier equipment requires 15 inches minimum clearance above top of doors.

WHERE HINGE-TYPE DOORS ARE PREFERRED
The hinge-type door is pulled up by a chain hoist. It can be used when there's insufficient room at sides of door opening to permit using the carrier-type door, and where aisle space is adequate.

CHECK THESE FEATURES

- √ Heavy Aluminum Sheets on Both Sides of Thick Vapor Proofed Insulation.
- √ Rugged Steel Frame.



STANDARD DOOR SECTION

Get the Best — Send for Details Now
STANDARD DRY KILN COMPANY
P. O. BOX 5708 • INDIANAPOLIS, INDIANA

NOW! An ABRASIVE BLADE
VIRTUALLY UNBREAKABLE!

FOR THOSE "TOUGH" CUTTING JOBS

Clipper "CBR" (BREAK-RESISTANT) BLADES

for . . .

MASONRY SAWS

HAND POWER SAWS

FLEXIBLE SHAFT SAWS

BEND—DROP—or TWIST in the cut . . . they're Virtually Unbreakable! Yes, Clipper "CBR" Blades are STRONG and SAFE and even more surprising the blade life is 50% to 100% longer than regular blades. It is not recommended for hard vitreous materials but rather the softer ranges of masonry. The most intricate cutting or grooving is now possible on Hand-Power Saws or Masonry Saws. Write today for prices and recommendations on this newest Dry Abrasive blade. Available in all diameters, arbor shapes and sizes.

DIAMOND and ABRASIVE BLADES for Any MASONRY or CONCRETE CUTTING

There's a Clipper Blade to cut your Brick, Glazed Tile, Fire Brick, Concrete block and Floors, Natural Stone, Glass and Porcelain. Available in sizes from 6" to 30". Choose Genuine Clipper for the FASTEST — CHEAPEST and LONGEST LASTING masonry cutting.

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SERVING THE WORLD AS THE WORLD'S LARGEST MANUFACTURER OF MASONRY SAWS

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SEND FREE LITERATURE AND PRICES ON: 92

☐ "C B R" BLADES ☐ MASONRY SAWS
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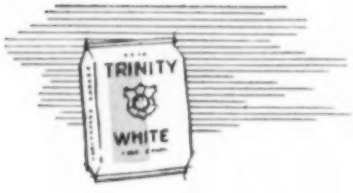
NAME _____
STREET _____
CITY _____ STATE _____

USE Trinity White

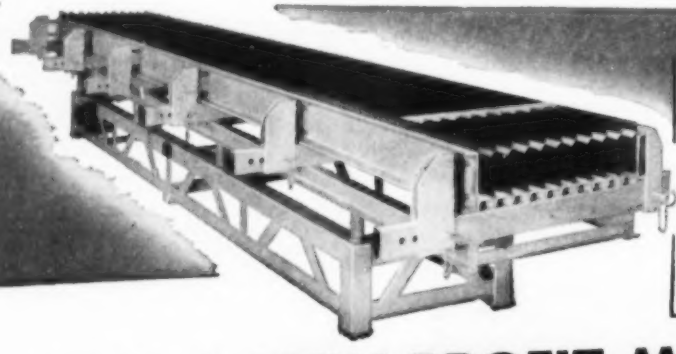
PORTLAND CEMENT

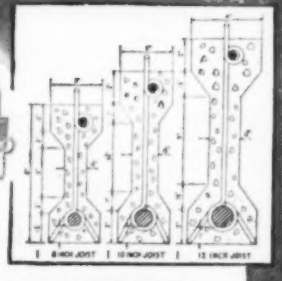
the whitest white cement



Trinity White is a true portland cement and has unexcelled beauty—the beauty of the whitest white . . . plus the best possible results when color pigments are added. Use it wherever you want greater masonry beauty or higher light reflection as for example: architectural concrete units; terrazzo; stucco; light-reflecting floors and walls. For descriptive literature, write Trinity White Cement, 111 W. Monroe St., Chicago.

A Product of GENERAL PORTLAND CEMENT CO. • Chicago • Dallas • Chattanooga • Tampa • Los Angeles





. . . ADD A NEW PROFIT-MAKER!

INCREASE YOUR VOLUME

Produce money-making concrete joists with the Kirk & Blum Heavy Duty Vibrating Table . . .

Only small investment required!

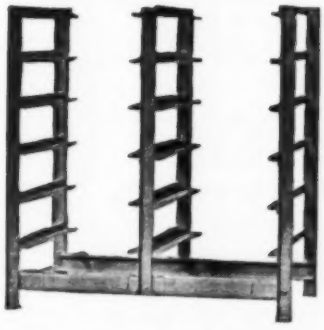
The addition of the Kirk & Blum Vibrating Table to your present equipment requires a very small initial cost, enables you to make an entirely new line of 8", 10" and 12" joists in 20 and 24 ft. lengths.

Cash in on the ever-growing demand for steel-reinforced concrete joists. Your experience and contacts in the building trade should make it easy to build up a profitable business in this new line. Concrete joists are simple to make, have unusual strength, are termite proof. The KIRK & BLUM Type "S" Heavy Duty Vibrating Table is capable of multi-production of concrete joists, allowing a fine profit-margin. Easily produced by unskilled operators. For complete details and prices, write to The Kirk & Blum Mfg. Co., 3112 Forrer Street, Cincinnati 9, Ohio.

KIRK AND BLUM

Manufacturers of steel forms of all types . . . Curb, Gutter, Sewer, Road.

CHASE BLOCK RACKS, CARS, PALLETS



Corrosion-Resistant Hi-Strength Alloy Steel

For Fork or Platform Lift Trucks

CHASE — THE LAST WORD IN
- DURABILITY
- ECONOMY
- EFFICIENCY

Sturdy construction
•
any style or capacity
•
Shipped knocked down
•
Rigid Field connections
•
assembled Easily

CHASE Foundry & Mfg. Co.
2400 Parsons Ave., Columbus 7, Ohio

DUR-O-WAL

WITH TRUSSED *Design*

LOOK! . . . Now It's Butt-Welded!

• High tensile, premium quality steel is embedded in the mortar joint for durability when you use Dur-O-waL. This backbone of steel is designed to assure maximum strength by utilizing the trussed design, architecture's oldest reinforcing principle. Dur-O-waL works fast, cuts time, saves money. Investigate this *patented* reinforcing, available in both flush and butt weld, today!

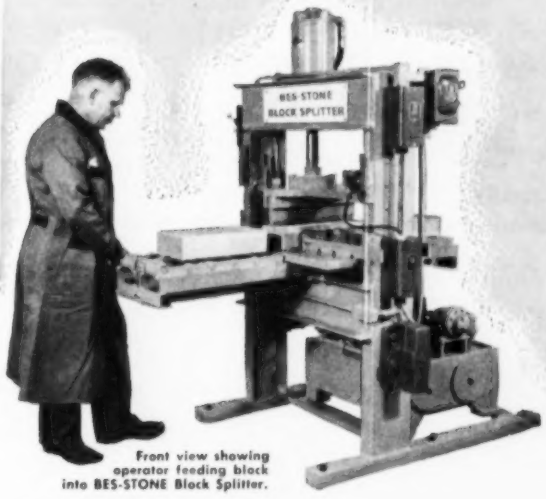
Write Plant Nearest You

Dur-O-waL Products, Inc.
P. O. Box 628
Syracuse 1, New York

Dur-O-waL Div., Dept. 655
Cedar Rapids Block Company
Cedar Rapids, Iowa

Dur-O-waL Div., Frontier Mfg. Co.
P. O. Box 49
Phoenix, Arizona

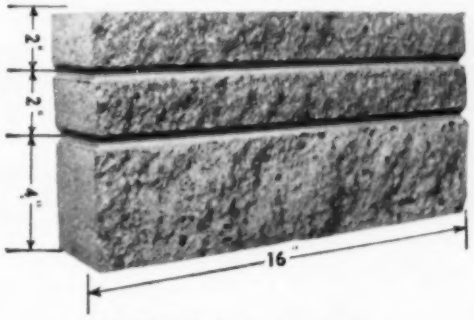
BES-STONE BLOCK SPLITTER



Front view showing operator feeding block into BES-STONE Block Splitter.

- **Operates Automatically**
- **Produces 960 Split Block Per Hour**
- **Easily Adjusted for Various Heights**
- **Splits in a Straight Line — No Culls**
- **Has a Powerful Hydraulic Action**
- **Combines Quiet Operation with Safety**

Here is another Besser machine — the BES-STONE Block Splitter — designed primarily for the Concrete Products Industry. The machine splits block with speed and precision, in a variety of modular sizes. It's fully automatic. The block is placed under the knife automatically . . . the blade descends with a smooth, hydraulic action . . . and the split block is ejected by the incoming block. The operator is always at a safe distance. The BES-STONE Block Splitter enables plant operators to offer additional lines and affords new profit possibilities. Write for Bulletin No. 95A.



BES-STONE in Modular Sizes

BES-STONE, the product of the BES-STONE Block Splitter, is a new masonry unit with a split-stone appearance, made in many sizes and in a series of attractive, permanent colors. You'll find it complements, and greatly increases your sales of standard stripper block.

BESSER

Complete Equipment for Concrete Products Plants

BESSER MFG. CO., ALPENA, MICH., U. S. A.

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NOW A FOOLPROOF PALLET INJECTOR

M & M ENGINEERS have developed a SIMPLIFIED, MAINTENANCE FREE PALLET INJECTOR for use on the Besser Vibrapac and Stearns No. 15 Block Machines.

Months of testing and re-engineering has evolved the MOST SUCCESSFUL, TROUBLEFREE PALLET INJECTOR yet to hit the market and PRICED RIGHT. CAN BE INSTALLED IN ONE HOUR.

10 DAY FREE TRIAL

Write — Wire — Phone

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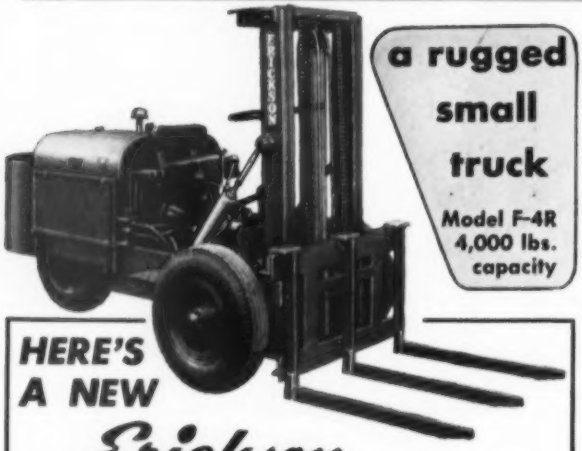
1017 W. 23rd Street, Indianapolis 23, Indiana

Phones: **Imperial 5496 - 5497**



a rugged small truck

Model F-4R 4,000 lbs. capacity

HERE'S A NEW Erickson

- Short Wheelbase & Turning Radius
- Complete Operator Vision
- Large 10-Ply Pneumatics
- 12" Center Underclearance
- Amazing Ease of Handling

For tricky ramps, rough or soft ground, cramped quarters—you will quickly become a booster for Erickson F-4R ease of handling, traction, balance, ruggedness. Comfortable seating space reduces operator fatigue. The F-4R is designed for more work per day—built for lower cost per year. Erickson quality is economy for you! Forks, mast and lift heights as ordered, twin tilt cylinders, 4 speeds forward, 4 speeds reverse. Side-shifter, scoop and other attachments available.

Send for Erickson Catalog on platform trucks to 7000 lbs. cap. and fork models 2000 to 20,000 lbs. cap.

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1403 Marshall St. N.E. • Minneapolis 13, Minn.

Erickson THE WORKHORSE OF LIFT TRUCKS

THE "Quinn Standard"

FOR CONCRETE PIPE

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that **Quinn pipe forms** and **Quinn mixing formulas** combine to produce the finest concrete pipe at lowest cost.

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For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.

WRITE TODAY. Complete information, prices, and estimates sent on request.

Also manufacturers QUINN CONCRETE PIPE MACHINES

QUINN WIRE & IRON WORKS 1627 12TH ST. BOONE, IA

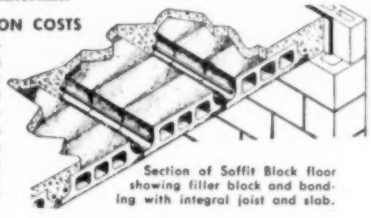
"I Find BOTH Profitable"

VIBRAPAC Block and SOFFIT Floor and Roof Filler Block

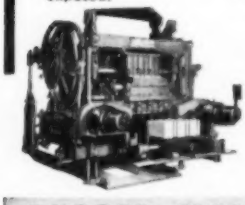
Vibrapac block plants are now adding to their profits by manufacturing Soffit Filler Block for floors and roofs. These units assure permanent, fire-safe construction, at low cost. Soffit Block provide maximum acoustical and insulation values with natural base for radiant heat installations. Made in various sizes to coordinate with other modular materials.

CUTS CONSTRUCTION COSTS

Temporary adjustable steel centers support Filler Block while slab and joist are curing. Conventional shoring is eliminated. The smooth, flush surface can be plastered, painted or left exposed.



Section of Soffit Block floor showing filler block and bonding with integral joist and slab.



BESSER VIBRAPAC

Vibrapac Block for walls, floors and roofs, in all styles and sizes, are made on a Besser Vibrapac, using one set of Plain Pallets. Fully automatic. No machine operator required. Write for descriptive literature.

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ALPENA, MICHIGAN, U. S. A.

Complete Equipment for Concrete Products Plants

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NOW MORE THAN 140 LICENSED MANUFACTURERS Producing

Patented **homeward** *Concrete* **STEPS**

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Homeward all metal forms are precision built to produce a product that requires no hand finishing.

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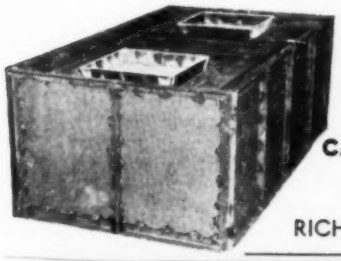
CARPENTER . . . Septic Tank Forms and Handling Equipment are a "headliner" for satisfying customers from coast to coast! This equipment is a high-speed producer of high-quality units. Saves time . . . minimizes costs. Our delivery rig needs only *one man.*



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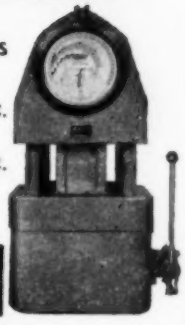

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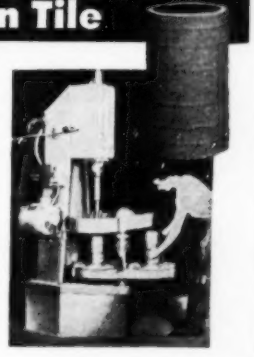
Make Money with Champion Cement Drain Tile

More millions of drain tile are needed to supply ever growing demand. The market is broad and profits are big.

The Champion makes the world's best drain tile. Densely compacted . . . ribbed for extra strength . . . every one truly concentric.

Champion machine is simple, compact and really rugged. Automatic feeder (optional) makes for 1-man operation. Write for literature—gives facts about the business and the equipment.



Concrete Equipment Co.
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. . . you need

OSWALT SERVICE

if you operate a Vibrapac concrete block machine

LOOK AT THESE NEW FEATURES:

Shock-Free Block Ejector and Front Pallet Feeder.

New Simplified Height and Density Control.

Improved Vibration and Machine Changes.

LISTEN TO THE PRODUCTION

figures that our subscribers are getting from OSWALT Complete Service:

Fine blocks produced up to speeds of 1080 units or more per hour . . . without sacrifice of quality . . . or cracking of green blocks.

Higher plant efficiency . . . lower operating costs . . . more profits.

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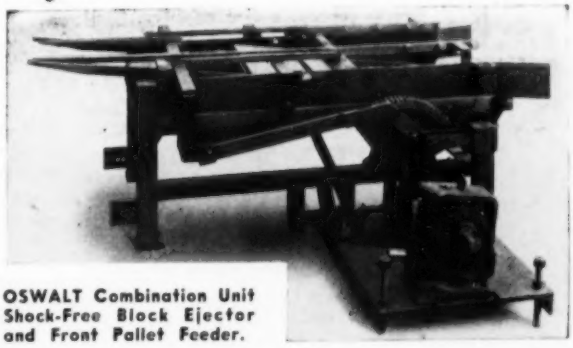

OSWALT Combination Unit Shock-Free Block Ejector and Front Pallet Feeder.

Write for name of OSWALT-Serviced plant nearest you.

Many satisfied subscribers operating scores of machines.

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ENGINEERING SERVICE CORP.

1335 Circle Ave. **Forest Park, Ill.**

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new truck-man 40

designed . . .

. . . FOR CUBING AND LOADING BLOCKS

THAT'S RIGHT, the new Truck-Man Model 40, two ton, High Lift was designed from forks to engine, especially for handling blocks. It is not just another industrial truck with special forks.

BIG 7.50 x 15, 10 ply Road Lug pneumatics on the drive wheels and 6.00 x 9, 8 ply rib pneumatics give you plenty of traction and footing for yard work. The big Ford engine, for ample power, and the short, 72", turning radius for peak maneuverability, mean that the Truck-Man 40 will really do a job in curing kilns and plant as well.

HERE ARE THREE BIG REASONS WHY THE 40 IS EASY AND ECONOMICAL TO MAINTAIN, TOO:

1 RUGGED — The big Ford Industrial Engine, oversized clutch, heavy duty transmission and axles insure less maintenance.

2 ACCESSIBLE — The tilt cylinder is mounted above floor decking for easy adjustment or service. Clutch, transmission or axles are removed in minutes for bench repairs. No need to pull engine for work as head and oil pan are easily removed.

3 STANDARD FORD PARTS — Serviceable at any Ford garage, include: hydraulic brakes, engine, differential, clutch, drive axle, and wear parts of steering axle.

Write or check coupon and mail for catalog with complete details on the Model 40 and 8 other versatile Truck-Man trucks.

truck-man
Div. of The KNICKERBOCKER CO.
571 Liberty St., Jackson, Michigan

☐ Have Salesman Call
☐ Send Catalog and Further Information

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TRANSO SCORES AGAIN! with the MODEL TLF-150

1½ yd. 4-Wheel Drive Load Master

AND HERES WHY...

1. **Powerful 4-wheel traction and floatation.** Utilizes *full* Loader power through maximum gripping action of tires.
2. **Patented "Bucket Rocking Action."** Assures fast, safe, *heaped* loads in seconds—uniform down pressure on hydraulic cylinders rocking the bucket smoothly into the load.
3. **Rugged, compact overall design**—clutch type reversing transmission with 4 speeds forward and reverse, powerful industrial engine, Torque Converter, heavy-duty axle assemblies of 16 to 1 ratio.
4. **No engine clutch**—replaced by highly accessible transmission master clutch at rear of machine that cuts reversing time 95% and is *completely replaceable* in 30 minutes.
5. **Full power steering.** Affords finger tip control . . . adds maximum maneuvering and handling ease.
6. **Simple, convenient arrangement of operators controls.** Provides greatest operating efficiency and comfort.

FRONT-END LOADER

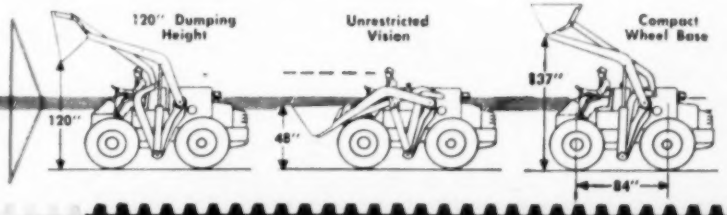
84" wheel base — 120" dumping clearance—137" bucket hinge clearance—80" maximum height—93" maximum width.

Whether loading, hauling, reversing, or dumping, Transo's big new TLF-150 LOAD MASTER efficiently combines traction and power with high traveling speeds.

Because of its unusually short wheel base and extended bucket lift arms a full 120" dumping clearance is possible. Its low 48" bucket carry position, allowing unrestricted visibility for the operator, adds safety and greatly contributes to the loader's perfect weight balance.

PATENTED and PAT. PEND.

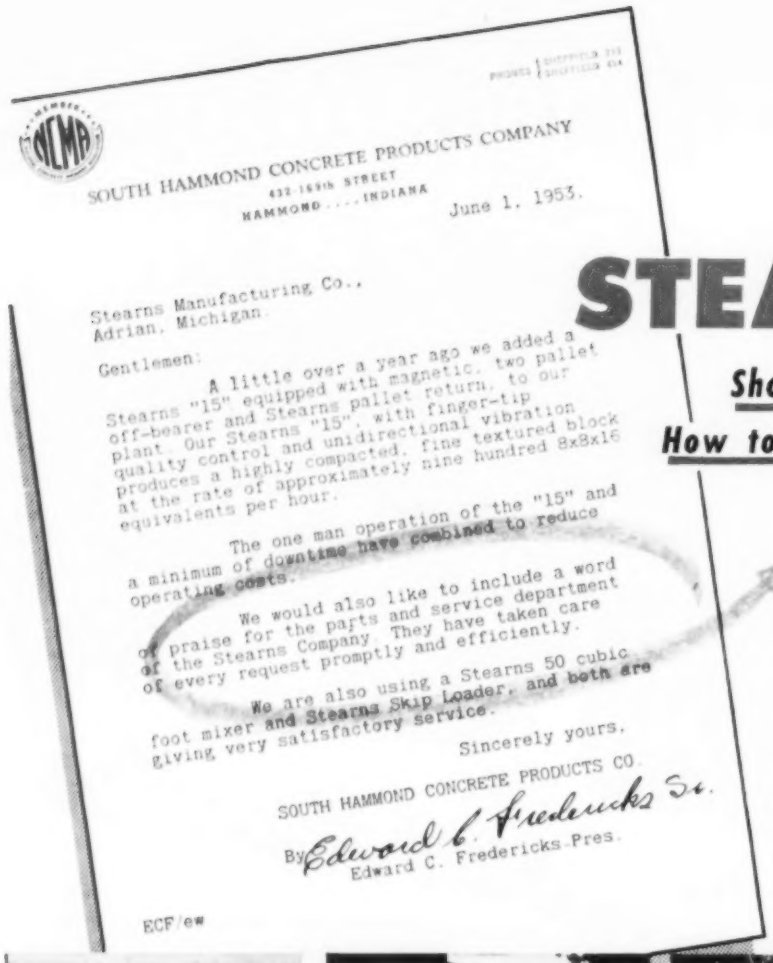
3 KEY FEATURES OF TLF-150 DESIGN



TRANSO

WRITE for additional information on the 1½ yd. TLF-150 as well as the other LOAD MASTER models—the ½—⅝ yd. TL-50 and 1—1¼ yd. TL-100.

THE TRANSMISSION & GEAR CO.
10421 HAGGERTY AVE. • DEARBORN, MICH.



SOUTH HAMMOND CONCRETE PRODUCTS COMPANY
432-169th STREET
HAMMOND ... INDIANA

June 1, 1953.

Stearns Manufacturing Co.,
Adrian, Michigan.

Gentlemen:

A little over a year ago we added a Stearns "15" equipped with magnetic, two pallet off-bearer and Stearns pallet return, to our plant. Our Stearns "15", with finger-tip quality control and unidirectional vibration produces a highly compacted, fine textured block at the rate of approximately nine hundred 8x8x16 equivalents per hour.

The one man operation of the "15" and a minimum of downtime have combined to reduce operating costs.

We would also like to include a word of praise for the parts and service department of the Stearns Company. They have taken care of every request promptly and efficiently.

We are also using a Stearns 50 cubic foot mixer and Stearns Skip Loader, and both are giving very satisfactory service.

Sincerely yours,

SOUTH HAMMOND CONCRETE PRODUCTS CO.

By Edward C. Fredericks Sr.
Edward C. Fredericks-Pres.

ECF/ew

STEARNS 15

Shows Veteran Block-Maker How to Reduce Operating Costs

"Parts and Service" Praised

Here is the one-man, fully automatic, 3-block-per-cycle, Stearns 15 Concrete Block-Making Machine which is showing the oldest, largest block-supplier in Hammond, Ind., how to really save money through its minimum downtime and lower labor costs. This great advance in plain pallet concrete products machinery for the larger plant is equipped with a Stearns automatic Pallet Return that eliminates all handling of pallets by hand and a Stearns Pneumatic Offbearer. Racking up blocks with the greatest of ease is Operator Edward Schultz.

Another successful family operation. Edward C. Fredericks, president of South Hammond Concrete Products Co., right, in front of his modern Stearns concrete block office, with, from left, his son, Edward, Jr., his sister and office manager, Mrs. Evelyn Wigley, and his daughter, Mrs. Caroline Collison. Starting operations in 1920, the company supplies blocks within an 80-mile radius for industrial and home construction.

Typical examples of highly compacted, fine textured Stearns 15 Block in the 2½-acre yard of this going Indiana company. Note the clean sharp edges and corners.

STEARNS 15

STEARNS 50

ZIPPERS

MIXERS

SKIP LOADERS

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OWNERSHIP . . .

THE KEY TO SUCCESS!

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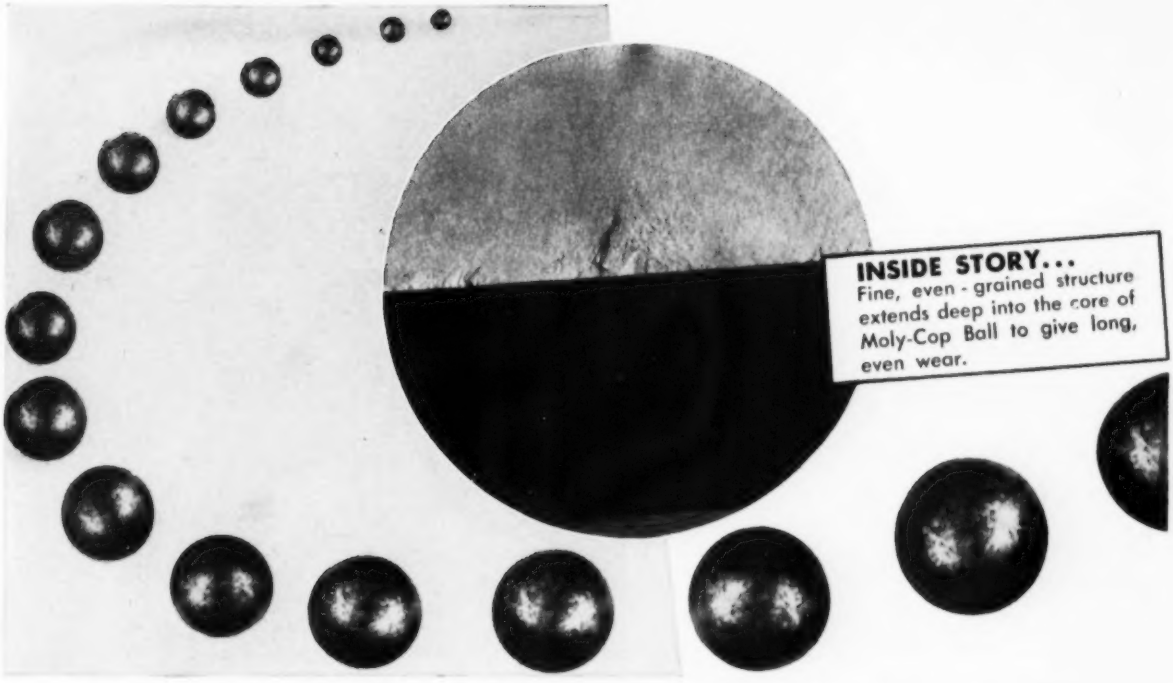
MAKE MORE AND BETTER UNITS FOR LESS WITH STEARNS CONCRETE PRODUCTS MACHINERY



If you want a finer grind . . . use a finer ball!

SHEFFIELD MOLY-COP

TRADEMARK REG.

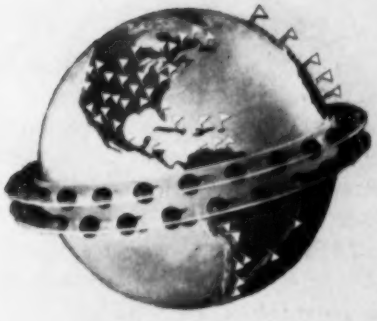
COPPER-MOLYBDENUM-ALLOY

Grinding Balls

For fine grinding you want a ball that will give you the highest possible production rate with the lowest cost per ton of material ground . . . fewer chargings, less "down time."

Sheffield Moly-Cop Balls meet that requirement — because Sheffield's exclusive alloy and automatically controlled manufacturing methods produce a ball of finer, denser, more uniform structure. You get toughness and greatest resistance to abrasion. Moly-Cop Balls wear evenly, retain their spherical shape longer.

Tests have proved that Moly-Cop Balls wear up to 35% longer than alloy cast steel balls; up to 50% longer than best quality unalloyed carbon forged steel; and up to 120% longer than cast white iron balls. Considering initial costs and length of service, the net savings that result from the use of Moly-Cop Balls are substantial.



Used and proved around the world—*Sheffield engineers* are ready to prove the money-saving advantages of Moly-Cop Grinding Balls in your operation. Get in touch with us now.

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This "Flying Saucer" carries Truth!

Crusade for Freedom brings hope to enslaved millions

The word "SVOBODA" on the balloon in this picture is the Czech word for "Freedom."

Supplementing Radio Free Europe in 1951, thousands of these "Flying Saucer" balloons were released by Crusade for Freedom along the borders of the Iron Curtain countries. They contained messages of hope and courage from millions of Americans who joined in the 1951 Crusade for Freedom.

LOOK WHAT YOU DID

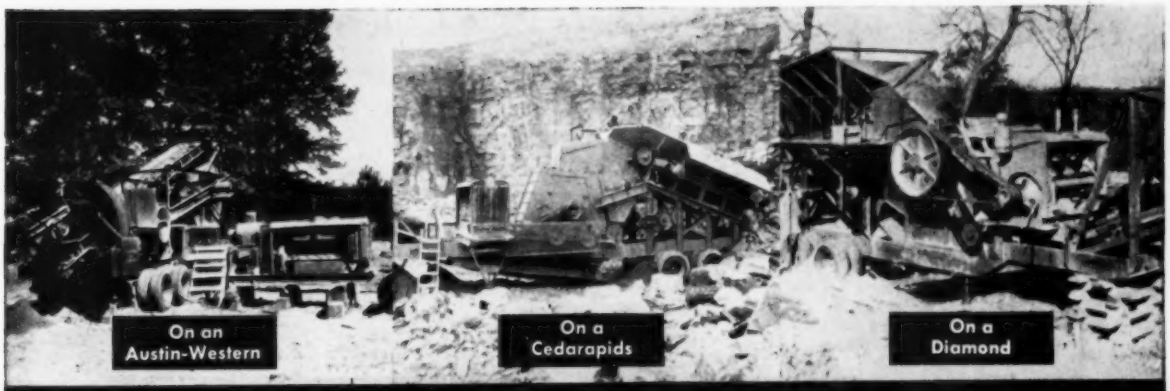
In the last two years the contributions of Americans to the Crusade for Freedom have amounted to $3,500,000. This money helped make possible Radio Free Europe's thirteen transmitters in Germany and Portugal. It also helped establish Radio Free Asia, which broadcasts to China in four different languages. These facilities are used daily to spike Communist lies and satisfy the hunger of millions for truth.

MORE HELP NEEDED!

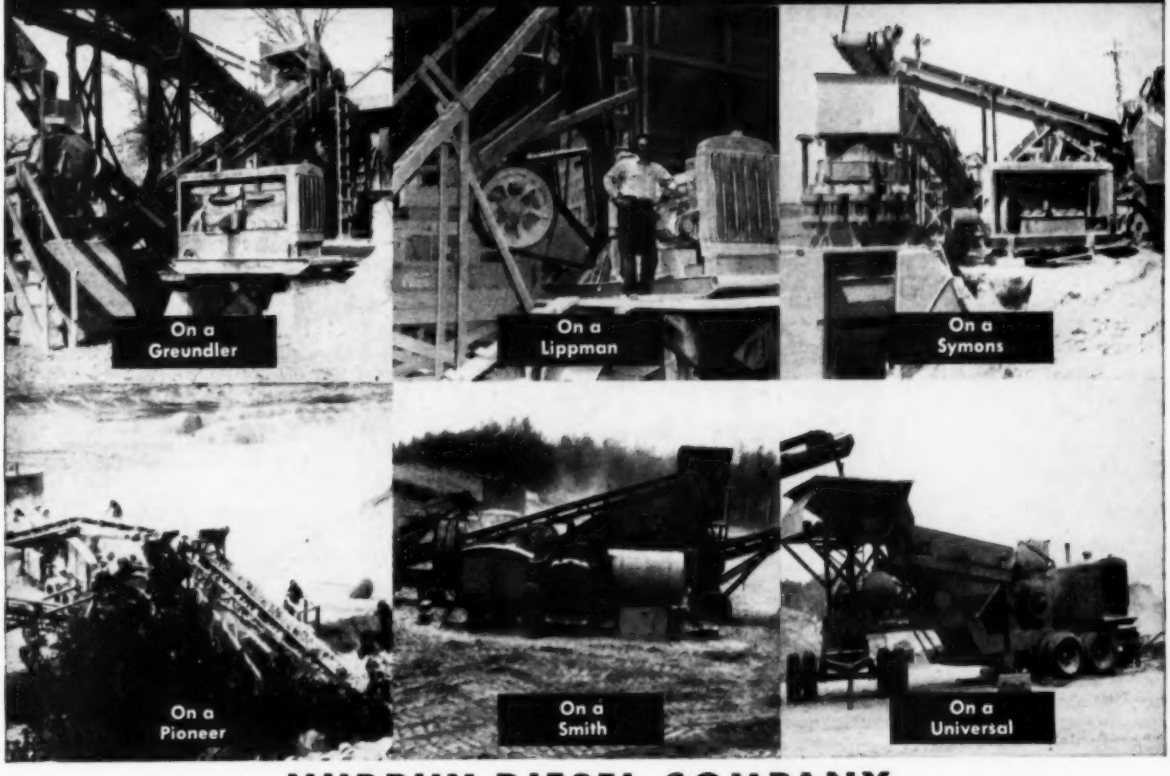
In 1952, at least $4,000,000 and the signatures of millions more Americans on leaflets ("Freedom-Grams") are needed—not only to carry on this operation but also to expand it on an even bigger scale.

Support this crusade of truth now.

Help Truth Fight Communism!
Join the Crusade for Freedom



Your crusher will perform better with MURPHY DIESEL POWER



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260

Engines and power units 90 to 240 H.P.; generator sets 60 to 140 K.W.

MURPHY DIESEL

Heavy duty power for rock crushing

Murphy Diesel engines and power units are available in sizes from 90 to 226 H.P. Engine speeds are 1200 and 1400 rpm.

"Packaged" generating units are available with capacities ranging from 60 to 140 K.W. A.C. or D.C. voltages.

The difference between Life... and Death...

"Why should you give blood? Ask me—I ought to know. I fought in Korea. But since then I've been through the biggest battle of all—the battle for life itself. And it was blood—and blood alone—that saved me. Don't know when I'll be in a position to start repaying my debt by giving some blood of my own. But I will—some day. You can count on it!"

All kinds of people give blood—for all kinds of reasons. But every reason for giving blood is a *special* reason . . . just as every American life that can be saved at any time and at any place . . . is special. So whatever *your* reason for giving blood, this you can be sure of: Whether it goes to a combat area, a local hospital, or for Civil Defense needs—this priceless, painless gift will some day save an American life!

Give Blood Now

CALL YOUR RED CROSS TODAY!

NATIONAL BLOOD PROGRAM

Business Executives!

✓Check These Questions!

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ☐ Have you given your employees time off to make blood donations?
- ☐ Has your company given any recognition to donors?
- ☐ Do you have a Blood Donor Honor Roll in your company?
- ☐ Have you arranged to have a Bloodmobile make regular visits?
- ☐ Has your management endorsed the local Blood Donor Program?
- ☐ Have you informed employees of your company's plan of co-operation?
- ☐ Was this information given through Plant Bulletin or House Magazine?
- ☐ Have you conducted a Donor Pledge Campaign in your company?
- ☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?

Remember, as long as a *single* pint of blood may mean the difference between life and death for *any* American . . . the need for blood is *urgent!*

BREAK UP THIS PLOT

Ordinary screens are in for a rough time when these three troublemakers put their heads together.

One sure way to curb their destructive activities is to install Super-Tempered Precision Space Screens.

Super-Tempered Precision Space Screens stay tight and wear longer under the most punishing attacks of vibration, abrasion and fatigue because they're made of hard and tough super-tempered steel, precision crimped and woven on powerful hydraulic looms. For greater tonnage output at lower cost, it pays to specify Super-Tempered Precision Space Screens. To order, write or phone our nearest sales office.

THE COLORADO FUEL AND IRON CORPORATION, Denver, Colo.
THE CALIFORNIA WIRE CLOTH CORPORATION, Oakland, Calif.
WICKWIRE SPENCER STEEL DIVISION, Atlanta • Boston • Buffalo • Chicago
Detroit • New Orleans • New York • Philadelphia

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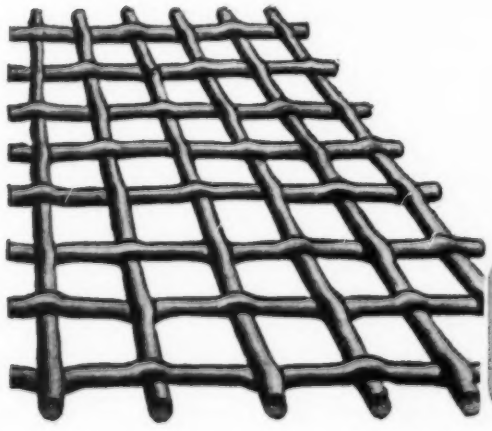

SUPER-TEMPERED
PRECISION SPACE SCREENS
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION
CF&I

WELLMAN *Williams Type*

FAST BUCKET OPENING SPEEDS OPERATIONS

• Double-hinge construction on Wellman's multiple-rope bucket permits faster opening than a single hinge. This speeds up operations, also gives a bigger spread in the open bucket for the same headroom.

Wellman's welded-design buckets offer you better performance and longer service. In all types and sizes you'll do better with Wellman!

Want Facts?

Write for free descriptive bulletins.

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CUSTOM-BUILT BUCKETS
STONE AND WOOD GRABS

THE WELLMAN ENGINEERING COMPANY
7014 Central Avenue
Cleveland 4, Ohio

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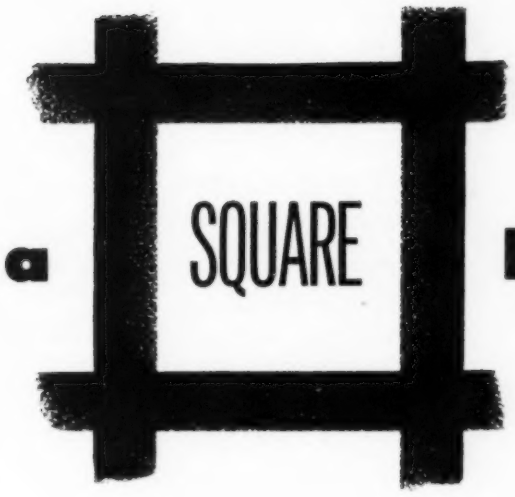

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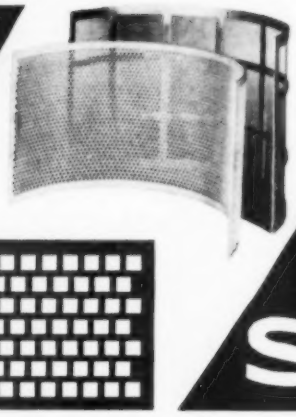

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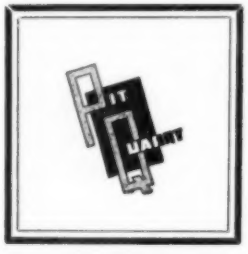

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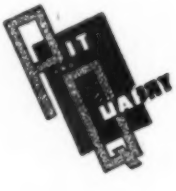

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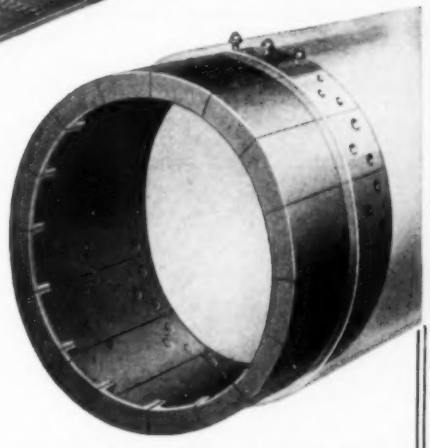

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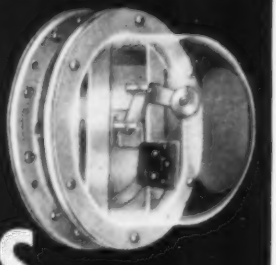

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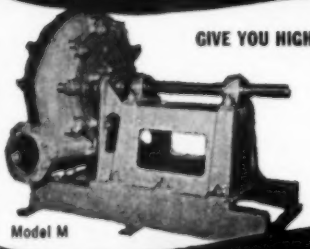

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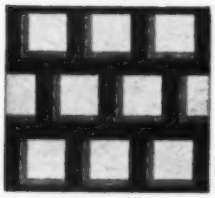

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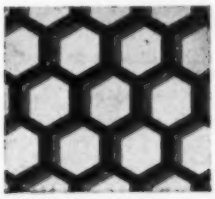

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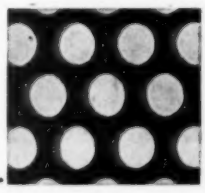

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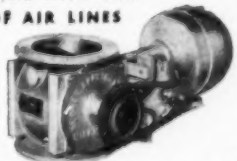

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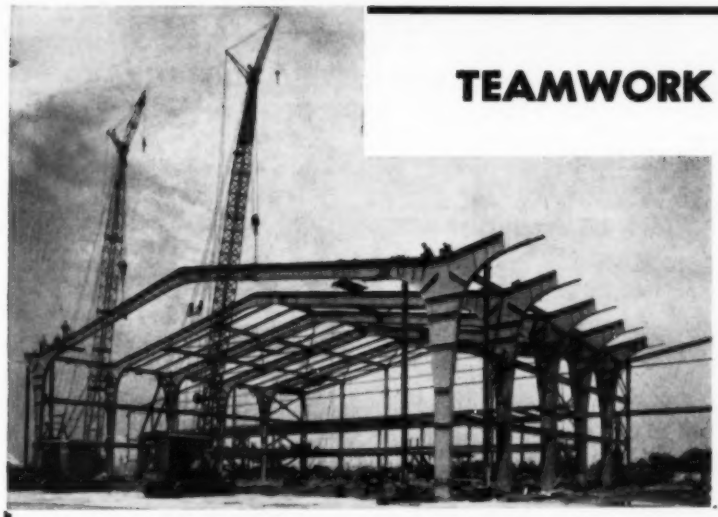

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- 8—Tyler Hummer Screens 3' x 15', 3' x 10', 3' x 5'.
- 1—Dixie No. 3650 Premier Hammer Mill, 100 HP motor.

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SINK FLOAT MILL: Wemco Sink Float Mobile Mill, capacity 360 tons per day, condition like new.
PORTABLE CRUSHING PLANT: Cedar Rapids 2 unit Plant, 40 tons per hour, used only four months.
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Pioneer 2436 Jaw, 4022 roll Port. Crushing PLANT. Also Telsmith 1832 Jaw, 28" Cone Plant. 2036 CR Primary.
CRUSHERS: 1524, 1836 & 2036 CR, 1536 Gruendler 3624 Farrell, 2450 Champion, 3042 Univ, 4836 Farrell, 4248 Traylor & 6048 Allis C Jaw. 19, 25 & 37 Kennedy. 13B, 16B & 36" Telsmith. 14" Traylor. 322R Allis GYR. 3' Symons std. & SH CONE.
52" x 30, 6x50 & 70" x 40' DRYERS. 7x45 & 7x64 Kilns.
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223,000# of ⅞ x 1¼" cyl. Grinding BALLS. New.
24" Belt Conveyor 126' centers.
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SHOVELS: ½ yd. Link Belt, Lorain 30, Buckeye 70, Link Belt L875, NW25, Marion 7, Lorain 77, Bucyrus 75B, Lima 802 & 1201.
Eight 22 ton Euclid Model TD rear dump TRUCKS
Repres.: Bonded Scale Co., Thurman Machine Co.

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1—72"x10'6"	Scrubber Telsmith GM Diesel Powered
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1—16'6"	Bucket Elevator Telsmith
1—15 cy	Sand Drag Cedarapids, 3ph, 60cy, 220V Motor
1—23 cy	Bin Single Compartment Cedarapids
1—3	Compartment Jackleg Bin, 40cy capacity

Crushers

1—24"x36"	Portable Primary Plant Universal Model 546-P-Hopper Plate Feeder—Grizzly—Jaw—30" belt—GM 671 Diesel—New 1950—Pneumatic Tire Mounted.
1—10"x24"	Portable Secondary Crushing Plant—Universal Model #2 Twin Dual Master—Pneumatic Tire Mounted—New 1950—10 x 24 Jaw—24 x 16 Dual Rolls—Hopper—Feeder—30" Belts—Rotovator—3 Deck Screen—GM 671 Diesel.
1—40"x22"	Roll Crusher Diamond, GM 675 Diesel Driven
1—40"x22"	Roll Crusher Pioneer, GM 671 Diesel Driven
1—	Intercone Crusher Telsmith Model #18 Buda Diesel
1—	Telsmith Semi-Portable Sand and Gravel Plant Consisting of Screen, Bucket Elevator Intercone Crusher Buda Diesel Drive

Conveyors

1—30"x100' Pioneer, 3 ph, 60cy, 220V Motor
1—24"x80' Pioneer, 3 ph, 60cy, 220V Motor
1—18"x60' Telsmith, 3 ph, 60cy, 220V Motor

Conveyor Belting

18" Wide x 4 Ply — 1/16" Cover — 500'
18" Wide x 5 Ply — 1/8" Cover — 150'
24" Wide x 4 Ply — 1/16" Cover — 100'
24" Wide x 4 Ply — 1/8" Cover — 350"
24" Wide x 5 Ply — 3/16" Cover — 150'
30" Wide x 5 Ply — 1/8" Cover — 150'

Other

1—Oil Heater Hopkins Volcanic Specialty Model #17 for use in handling asphalt, etc.
1—4 x 3 Pump Multistage, Gorman Rupp, Model 7361 Chrysler Gas
1—12x10 Wellpoint Pump, Griffin Vac. Shed-mounted, GM Diesel

Screening Equipment

1—5'x12" 2 Deck Vibrating Screen Telsmith #26S, 3 ph, 60cy, 220V Motor
1—4'x12" 2 Deck Vibrating Screen Cedarapids #13531, 3 ph, 60cy, 220V Motor
1—4'x12" 2½ Deck Vibrating Screen Pioneer, 3 ph, 60cy, 220V Motor
1—4'x10" 2 Deck Vibrating Screen Pioneer, 3 ph, 60cy, 220V Motor
1—2'x 8' 2 Deck Vibrating Screen Telsmith

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100' boom Fairlead & high gantry frame for 54-B
2½ Yd. Page drag bucket
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9" x 16" buckets and numerous other items, such as hammermills, power units and screens of various sizes.

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3 Phase, 60 Cycle, 220 or 440 Volts (•2200 volts or higher)

HP	Make	Type	Speed
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2000	•G. E.	MT-30	237
1500	•G. E.	MT-30	240
1250	•Westgh.	CW	600
1000	•Westgh.	CW	250
700	•A. C.	ANY	720
500	•G. E.	IM	3600
500	•G. E.	MTP	1800
500	•G. E.	MT	450
500	Westgh.	CW	350
400	A. C.	3-brg.	450
400	•G. E.	MT412	450
350	Westgh.	CW	900
300	•G. E.	IM13A	1800
300	•G. E.	MT410	450
250	Westgh.	HF15H	600
200	G. E.	IM15	1200

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Cummins 200 HP.	174.64 ea.	229.22 ea.
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Hardinge 5'x22", 6'x22", 8'x22", 10'x36" & 10'x48".
Ball Mills 6x6, 6x10, 7x6 & 8x6.
Rod Mills 4x7, 5x14.
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Hercules Junior 3 Roll Mill.
3 & 3 Raymond Automatic.
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5', 8', 14' & 16' Air Separators.
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Double Shell: 70"x30' & 70"x47'.
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Loomis 44, Keystone 51 & 71.
10—IR—FM2—Wagon Drills.
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Newhouse 7", 10", 14"—Kennedy 198, 258, 378—Sup. McC. 6"—Al. Chal. 322R, 232R, 530R—Traylor TY 36".

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6", 10", 14" & 20" Sup. McC.—Gates Al. Chal. 3, 4, 5, 6, 7½, 8, 9, 12.
Parts for 42" Superior McCully.

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15—8000, 10,000 and 20,000 gal. cap. with coils.

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100—8000 & 10,000 gal. cap. Tank Cars.
100—50 Ton & 70 Ton Battleship Gondolas.
80—50 Ton Cap. Flat Cars.
10—Side Dump covered, 70 ton Hopper Cars.

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DIESEL: 15, 30, 45, 65 & 100 Ton.
GASOLINE: 3 Ton, 5 Ton, 8 Ton, 12, 14 & 30 Ton.
STEAM: 9 Ton, 20 Ton, 40 Ton, 60 Ton & 80 Ton.
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6600 Ft. 36, 42, 48 & 60 In. Wide.

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This particular machine was used by the Corps of Engineers to dry and heat aggregate for bituminous material. This machine is war surplus, having been in overseas service—needs work. This machine has not been used much but is rusty and needs some sand blasting, etc.

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12—4" Heavy Duty Bingham vertical sand pumps
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4—Wilfley size 5CB horizontal centrifugal sand pumps
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Champion 1030 jaw crusher, roller bearings
Traylor type H 9"x16" jaw crusher
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Penna. 8XT-8 hammermill with 125 hp. motor
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Bonnot double roll coal crusher, 24"x30"
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Sturtevant Fine Crusher 00 with 2 hp. motor
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40 hp. 115 volts DC motor, 3/60/450 volts, 31.3 KVA Alternator
Motors to 125 hp., reducers and gearmotors
Gears, chain, sprockets, V belt pulleys
Single deck 4' x 6' vibrating screens
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Single & Double deck new Universal screens
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Crucible Steel Co. 1¾" steel rock bits
140 feet 14" wide gravity conveyors with chairs
Pumps, bin gates, trolleys
Enclosed and open chain-belt bucket elevator
Elevator buckets and elevator chain
Apron conveyors: 18"x 7', 24"x 46', 30"x 22', In frame
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New elevator belts from 8" to 18" wide
Conveyor equipment for 14", 16", 18", 24", 30", 36", 42"
New and used conveyor belt up to 36" wide
Flat belt idlers for 20" and 42" wide
Belt tripper for 14" belt, with 2" rails

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1—30 Ton Orton Diesel Loco. Crane
1—20 Ton P&H 255 Truck Crane
1—20 Ton Lorain MC-414 Truck Crane
1—25 Ton Koehring 304 Truck Crane
1—30 Ton Davenport Diesel Locomotive
1—45 Ton GE Diesel Electric Locomotive
1—5W Monighan Walker 110' B.
1—151 Marion HL Electric Shovel

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1 Model 880 UNIVERSAL SENIOR DIESEL
1 Model 880 UNIVERSAL JUNIOR DIESEL
1 PIONEER 152 P R PRIMARY 24 x 36 DIESEL
1 TELSMITH MODEL 1832-28-2 UNIT
Gasoline operated 40-74 tons cap. per hr.

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QUARRY EQUIPMENT

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Cedarapids Rock-It plant w/2025 jaw, 3033 hammermill.
4033 Cedarapids Model 6C plant. New.
2020 Cedarapids double impeller. New condition.
4024 Cedarapids roll. Rebuilt.
3018 Cedarapids roll. Rebuilt.
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1036 Telsmith Wheeling.
B-3 Jeffrey swing hammer pulverizer. Rebuilt.
60" dia. x 14' Traylor revolving screen. Rebuilt.
24" Wemco single pitch sand screw. New condition.
15 cu. yd. Cedarapids sand drag. New.
16" x 90' bucket elevator.
60-ton, 2-comp., 8'x18' storage bin w/clam gates.
Special bins to your specifications.
Conveyors—18"—24"—30"—36". Also belt.
24" Dia. x 30" face magnetic pulley.

SHOVELS AND CRANES

Lorain 77, 1½-yd. diesel.
Lorain 75B, 1¼ yd. diesel.
Lorain L-50-I, 1-yd. diesel.
Lorain 40 truck crane on Mack 3-axle truck.
Lorain MC-2 Moto-Crane.
Link Belt LS85 diesel combination.
Unit 514, ⅛-yd. gasoline crawler shovel, rebuilt.
Lorain 30A, ½-yd. gas combination.

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Sanderson-Cyclone No. 42 well drill, new.
Sanderson-Cyclone No. 44 well drill, new.
Used Sanderson-Cyclone Model 42 on Dodge Truck.

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45" Ohio lifting magnet, rebuilt.

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500 cu. ft. Gardner-Denver diesel, rebuilt.
365 cu. ft. Gardner-Denver diesel. Rebuilt condition.
105 cu. ft. Schramm was powered on 4 steel wheels.
Worthington 2-stage, water-cooled, vertical 250#, 60 CFM, new condition.

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Euclid Trucks 15 Ton—22 ton End Dump—15 Yd. and 25 Yd. Bottom Dumps—12—25 Yd. Bottom Dump without tractors.

4—Elec. Std. Ga. Dump Car locomotives—600 volt with 17—std. ga. air dump cars—25,000 lb. cap. 130 Cu. Ft. level with all elec. equip. Goodman 10 Ton Mine Loco—250 Volt 36" Gauge. Ottumwa Mine Hoist—1¼" Rope—200 H.P. Motor—525 RPM. complete.

Jaw Crushers 36" x 48" Nordberg—36" x 48" Farrel—60" x 48"—42" x 40"—42" x 30"—24" x 36"—18" x 36"—15" x 36" Symons Cone 5½'—4'—3'—2'—50 x 40 Dixie hammer mill—54" Traylor Type T—42" McCully—48" Gyrosphere.

Shovels — Roll Crushers — Rod Mills—Ball Mills — Rotary Kilns — Dryers—Log Washers — Classifiers—Mine Hoists—Transformers—Motors—Gravel Plants—Blast Hole Drills—27T-29T-42T Generator Sets—Drag Lines.
2—25' A.C. Log Washers.

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One—Fairbanks-Morse Diesel Engine 5 Cylinder Model 35F 150 H.P.—450 R.P.M.

One—Symons 3 ft. Cone Crusher Standard Shop #3780

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P & H clamshell bucket, two drum overhead crane 7 tons capacity operating on 3/60/440 volts. Can arrange bridge length to suit.

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TROUGHING IDLER CONVEYORS

We will take our loss on our stock of short length belting and previous model idlers. You can save as much as 50% by buying the BONDED CONVEYOR SPECIALS listed below and accepting your conveyor belting in two pieces. Idlers belting and conveyor sections are all new.

Quantity	Belt Width	Length of Conveyor	List Price	Sale Price
1	18"	25'	$1229	$658
1	18"	35'	1559	814
1	18"	50'	2054	1043
1	18"	85'	3209	1581
1	18"	125'	4529	2096
1	24"	25'	1322	739
1	24"	30'	1507	824
1	24"	45'	2062	1085
1	24"	65'	2721	1451
1	24"	85'	3542	1806
1	24"	100'	4097	2037
1	30"	25'	1421	806
1	30"	35'	1841	997
1	30"	50'	2471	1588
1	30"	65'	3101	1617
1	30"	80'	3731	2295
1	30"	100'	4571	2768
1	30"	125'	5621	2818

Belting is 4 ply, 28 oz. duck, ⅛" top rubber cover and 1/32" bottom cover.

CONVEYOR BELTING

Famous brands at deep cut prices. Fresh Stock.

Width	Ply	Top Cover	Bottom Cover	Duck Carcass	Price
14"	4	⅛"	1/32"	28 oz.	$2.30/ft.
16"	4	⅛"	1/32"	28 oz.	2.40/ft.
18"	4	⅛"	1/32"	28 oz.	2.50/ft.
24"	4	⅛"	1/32"	28 oz.	3.23/ft.
30"	4	⅛"	1/32"	28 oz.	3.97/ft.

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3-roll Troughing Idlers for these sizes:
16" belt .....$17.25 30" belt $19.50
18" belt ..... 18.00 36" belt 20.25
24" belt ..... 18.75 48" belt 21.75

1-roll Return Idlers for these sizes:
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18" belt ..... 7.13 36" belt 8.75
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All steel. Interchangeable with other well known makes. Replaceable ball bearings. Rust proof ball races; maintenance is negligible.

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Ready-Made Head, Tail and Intermediate Conveyor Sections
All Types Idlers, Return Rolls and Belting in Stock

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Bonded double roll crushers. For crushing cinders, pumice, perlite, and similar materials. Capacities to 100 tons per hour. Steel hoppers included.
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Others to 50 ton capacity. All scales complete with structural steel. Parts and weighing beams for most makes of motor truck scales.

Stock Models of All Types for Immediate Shipment—Special and Unusual Conveyors Built to Order—Complete Systems Designed, Engineered and Manufactured

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Conveyors: 130 ft., 30" New Belt
Plate Feeders: One Large; One Medium
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45 x 10 ft.—50 Ton
Portable Steel Preparation Plants
All guaranteed like new. Must liquidate.

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TD-14 International, #TDE 9010T7BJ with Bucyrus-Erie Bullgrader #3722 (Hydraulic 12' blade).
TD-18 International, #TDR162B1T7BH, with Bucyrus-Erie Bullgrader #75099 (Hydraulic 13' blade).
TD-24 International, #TDE 2053, with Bucyrus-Erie Bulldozer #78760 (Cable, 11' blade).
Model F LeTourneau Carryall #S7557YR131.
All located at our warehouse in Middlesboro, Kentucky. May be inspected at any time. Write or call for particulars.

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Avoid delays in your production schedules!

We carry in stock for your immediate requirements, Conveyor Belting in widths from 8 inches to 48 inches.

Width	Ply	Thickness Top Cover	Thickness Bottom Cover	Type of Duck Carcass
8"	4	1/16"	1/32"	28 Oz.
10"	4	1/16"	1/32"	28 Oz.
12"	4	1/16"	1/32"	28 Oz.
14"	4	1/16"	1/32"	28 Oz.
16"	4	1/8"	1/32"	28 Oz.
18"	4	1/8"	1/32"	28 Oz.
20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
24"	5	1/8"	1/32"	28 Oz.
26"	5	1/8"	1/32"	28 Oz.
30"	4	1/8"	1/16"	32 Oz.
30"	5	1/8"	1/16"	32 Oz.
30"	6	1/8"	1/16"	32 Oz.
36"	6	1/8"	1/16"	32 Oz.
42"	5	1/8"	1/16"	32 Oz.
48"	5	1/8"	1/16"	32 Oz.
48"	8	1/8"	1/16"	32 Oz.

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These machines reconditioned in our newly-built daylight plant. Come see them!
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Pettibone Mulliken "421" Swing Loader, ¾ yd., 4-wheel drive. Demonstrated 30 hours @ Dealer's Cost.
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Trailer, 18-Ton, Single Axle, semi Low-Boy w/Mack Tractor.
Cedarapids Portable Primary Plant on Pneumatics w/1524 Jaw Crusher, 24" x 6'0" Apron Feeder, gas power, 30" discharge conveyor, etc.
Universal 880 Jr. Portable Gravel Plant, 1024 Jaw, 24 x 16 Rolls, etc., Pneumatics.

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Lime Model 34 Paymaster ¾ cubic yard shovel with GMC diesel engine. Machine new in 1947. In excellent condition, ready for a full season's work.
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4—15,200 gal. Horiz. Welded Steel Tanks (Virginia).
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2 ROTARY KILNS ½ IN. THICK
7' x 5'6" x 60' LONG
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two	6,500.00
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Griffin Well Point System.
Also, trucks, concrete mixer, Fordson tractor.

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Subject prior sale or disposition.

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One complete stone quarry and crushing plant having 100 to 125 tphr one inch size and less capacity; exclusive territory; all electric power; 20 acres of limestone meeting State tests. Plant located in Allen County near Scottsville, Kentucky. This Plant is two years old, having sold 65,000 tons in 1952 and in excellent condition. Immediate possession. Reason for selling desire to reduce size of operation.

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Explosion Proof Motor Headquarters

JAW CRUSHERS—7″ x 12″ up to 42″ x 48″.
CRUSHING ROLLS—16″ x 10″ up to 54″ x 24″.
GYRATORY CRUSHERS—3 up to 8 12. Also one 14″, 16″ & 42″ Superior McCully gyratory crusher.
SWING HAMMER MILLS.
ROTARY FINE CRUSHERS—21, 21¼ and 22.
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1—3′ x 30′ Christie Indirect Heat Dryer.
2322 & 2636 Allis-Chalmers type R Hydrocone Crushers.
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AIR SEPARATOR—5′, 6′, 8′, 14′ dia.
1—Complete Lime Hydrating Plant.
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1—7′x60′ CALCINER, made by Struthers-Wells. 9/16″ shell, Timken roller bearing supports, Farrel Birm. gear reducer, with V-belted AC motor, firing hood, seal ring. With Vanderwerp-Manitowoc Recuperator, in excellent condition.

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8—6′ x 40′, 5′ x 40′ Ruggles-Coles; 54″ x 25′ Class Xf-4 Ruggles-Coles, also 3—3′ x 50′, x 5′ x 50′, 6′ x 60′, 7′ x 70′ Direct Heat. Also 3—6′ x 50′ Louisville Rotary Steam Tube.

3—3′ x 50′ Rotary D. H. Dryers or Coolers.

6—Link Belt Roto-Louvre Dryers: #207-10 (2′ x 7″ x 10′) #310-16, #503-10, #604-20, two #604-24.

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Jaw—2″ x 6″, 6″ x 15″ Sturtevant; 18″ x 36″ and 24″ x 36″ Farrel; 42″ x 48″ Traylor; Rolls: 42″ x 16″ Allis-Chalmers Type B; 24″ x 32″ Penna. single roll. Portable Plants—Cedar Rapids 1036-BBB; 2540-AAAA, 2036-AAA, also Pioneer with 30″ x 42″ primary and secondary crushers, all Diesel driven.

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2—#51 Raymond Imp Mills.

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8—Pebble Mills, porcelain lined; 3—6′ dia. x 8′ 800 gals. each. 1—6′ x 5′, 3—5′ x 4′, each with ball charge.

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2—Raymond 6′ and 16′ dia.; 1—8′ Gayco; 1—16′ Sturtevant.

LIME HYDRATING PLANT:

1—Complete Lime Hydrating Plant, incl. Kreitzer Hydrator, Raymond Pulverizer, Jeffrey Pulverizer, Hummer Screen, etc.

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3—Selectro 3′ x 8′ 2-deck; 1—3′ x 8′, 1-deck, all totally enclosed, heavy duty.

1—3′ x 6′ Colorado Iron Works, 1-deck.

2—4′ x 10′ Tyler Niagara, 2-decks.

8—Tyler Hummer, 3′ x 5′, 4′ x 5′, 4′ x 10′. Also #38 4′ x 10′.

DORR CLASSIFIERS:

2—2 stage Washing Classifiers, each with two rakes in tandem, in steel trough 26′6″ long x 3′ wide, with drives.

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#1 RAYMOND AUTO PULVERIZER WITH THROWOUT, SEPARATOR & CYCLONE.
KUNTZ 5 x 20 CONTINUOUS HYDRATOR.
3 ROLL BRADLEY HERCULES JR. PULVERIZER.

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4x20, 4x45, 5x50, 6x60 ROTARY KILNS OR DRYERS.
5½x7x60, 7x45, 7x64 & 8x80 ROTARY KILNS.

10 SURPLUS NEW MERRICK WEIGHTOMETERS

For 18"—24"—30"—36" & 42"

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3 Ft. Traylor TY Reduction.
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48 x 60 Superior Type-Jaw.
24 x 36 Farrell Jaw.
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8—4 ton & 8 ton GOODMAN 36 IN. GA. BATTERY & TROLLEY TYPE.
10 TON DAVENPORT GAS. STD. GA.
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65 TON G.E. DIESEL ELEC. STD. GA.
4—100 TON G.E. DIESEL ELEC.
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6 TON BROOKVILLE 36 GA. DIESEL.

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1—BUCYRUS ARMSTRONG 12 BIT DRESSER.
2—I.R. QUARRYMASTERS.

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Barber Greene 82A—3 yd. cap., gas operated.

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1—20,000# Allis-Chalmers, Dbl Drum
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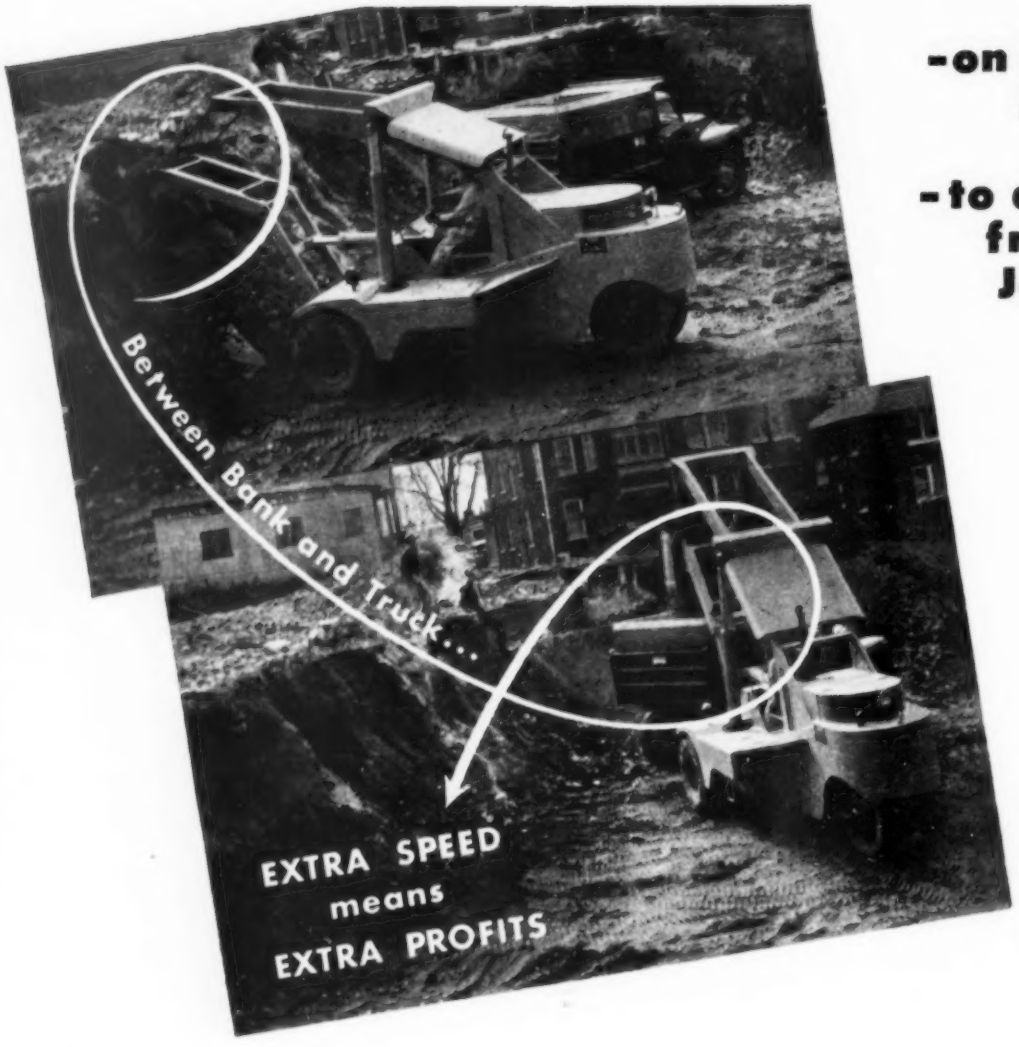

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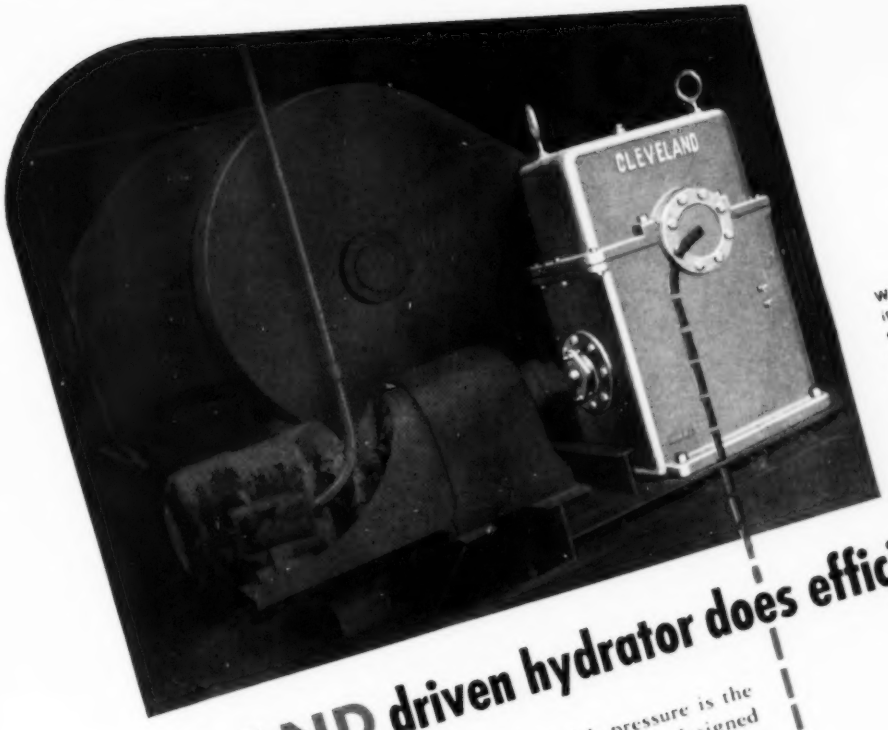

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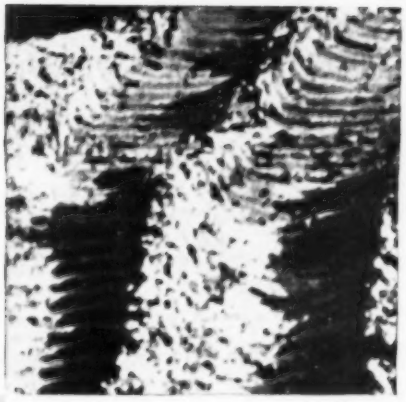

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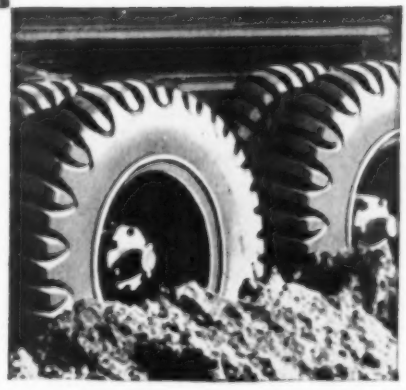

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